The Iron Age

A Review of the Hardware and Metal Trades.

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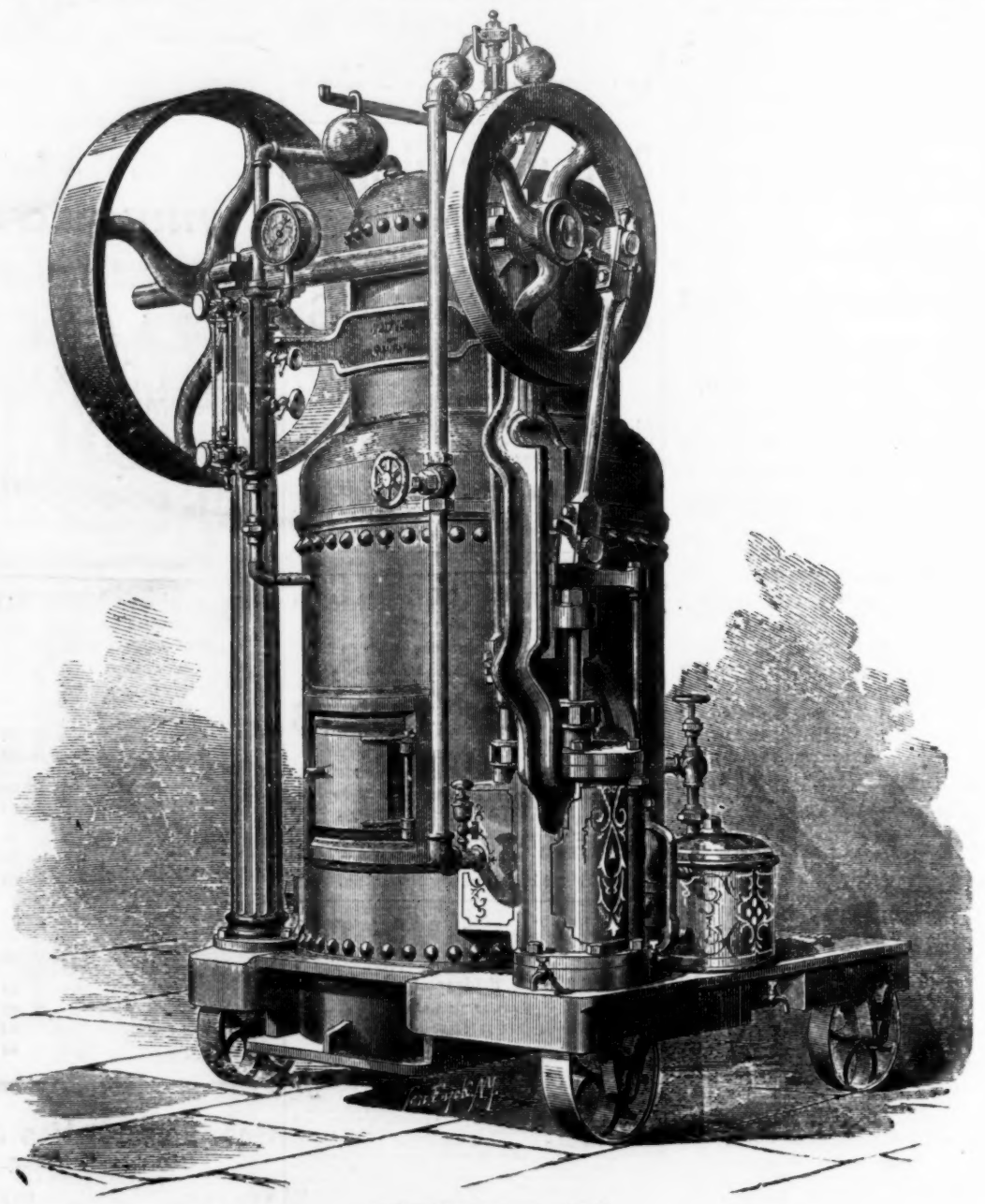
The Shapley Engine.

The boiler of the steam engine has been too much neglected of late years by inventors, who, as a rule, have turned their attention to the more attractive theme of the engine. The result has been a vastly greater improvement in the engine than boiler. In a great many instances the wastefulness of the boiler has been very great, while the engine was working with a reasonable degree of economy. In the engine and boiler which we illustrate the aim has been to make a good, safe and economical boiler, and, at the same time, to produce an engine which should use the steam with a reasonable degree of economy.

The boiler, shown in section in Fig. 2—on third page—consists of a conical fire box, surmounted by a flat crown sheet, and inclosed within the shell of the boiler. The shell is made in two sections, the lower part connected to the upper by an annular head. From the upper part of the fire box, just below the crown sheet, short horizontal tubes A give free communication into the outer air. The tubes B extend downward from the annular head to the base. A circular jacket, or case C, prevents the fire from the fire box from passing into the open air. The base of the boiler is converted into a flue, and takes the smoke from each of these tubes and conveys it to the smoke stack. The sides of the fire box are inclined, which gives the surfaces the maximum efficiency. The hight of the boiler is considerable, so that the crown sheet has a considerable depth of water over it, and, at the same time, the fire box is made of ample size and hight. The flues are all easily accessible for cleaning from the outside, simply by the removal of the jacket *c*. The top head of the boiler is of cast iron, riveted in the usual manner. To prevent the throwing of sparks, the bottom of the flues in the base plate are kept covered with water, so that, as the gases pass down the side tubes the sparks fall into the water and are extinguished. Though not shown in the sectional view, the crown sheet is stayed so as to give it ample strength. These boilers give the rated power with 60 pounds per square inch, though they will stand 120 lbs. with perfect safety.

The engine is of the vertical type, not bolted to the boiler, but having a frame of its own fastened to the bed plate of the boiler. A plain D valve is used driving a single eccentric, cutting off at ⅛ of the stroke. The pump is of the locomotive pattern; the parts are held together by a stirrup and a single screw driven from the cross head. Piston rod, valve stem, crank pin and the like, are of steel. Journals are rabbitted, slides made large, and the bearings generally well fitted. The fittings of the engine are neat and convenient. The exhaust is passed through a feed water heater on the bed plate before escaping into the smoke stack. The engines are built of 3, 5, 8 and 12 horse-power. The boilers are of the same size and also 15 horse-power, the latter for use with the 12 horse-power engine. A favorite way of combining them is to put an 8, 12 or 15 horse-power boiler with a 5, 8 or 12 horse-engine. Messrs. Shapley & Wells manufacture this engine, which is for sale by R. W. Wilde, the sole agent, 20 Cortlandt street, N. Y. We should not omit to say that the parts of these engines are duplicates and interchangeable, so that no difficulty is experienced, in case repairs are needed, in obtaining them from the manufactory.



THE SHAPLEY ENGINE.—*Fig. 1.*

The Determination of Carbon in Iron and Steel.

A correspondent in Chicago, who signs himself "An Old Subscriber," writes as follows:

I have had a dispute with a friend as to the best and quickest process for determining the amount of carbon in steel. If you would please to state in correspondent's column of your publication, in the next issue if possible, you would greatly oblige.

There are several methods of determining the percentage of carbon in steel and iron. All the processes are quite different, and can only be performed with accuracy by experienced chemists. We conclude that our correspondent is not a chemist, or he would not have written as above. Probably the easiest process is the colorimetric method, but this is less accurate than others. For the information of all to whom the subject may be of interest, we give below the valuable paper on "Carbon Determinations in Iron and Steel," read at the Detroit meeting of the American Association for the Advancement of Science, by Prof. John W. Langley. It is much fuller and more accurate than anything we could write on the subject, even if we had the time to spare:

The determination of the amount of carbon in iron and steel has long been recognized as an analytical process of extreme difficulty.

To make an approximate estimate is easy, but when figures accurate to the second decimal place of percentages are the objects of inquiry, the number of apparently insignificant sources of error becomes so great that only the most minute and conscientious attentions to details will insure a result which has any value at all, when judged by the severe requirements which the engineer makes upon the metallurgist.

Not only is any process for the estimation of carbon intrinsically difficult, but no two methods will give the same results, and when the averages of two series of analyses, conducted with equal care but by different methods, are compared, they will usually differ from each other by more than one-tenth of one per cent.

In view of the attention which has recently been drawn to the connection between physical properties and chemical composition in the metals and alloys principally employed in the arts, and in which investigation steel, of course, plays a leading part, it becomes more than ever desirable for the analyst to select, out of the various means now at hand for the estimation of carbon, that which can be the most easily controlled and by which the operator can with the greatest certainty assure himself that like conditions may be repeated at will.

In an ordinary determination of the carbon in an organic body, the possible variations in the method of procedure are not numerous, nor do they seem to have much influence on the final result. In the case of iron and steel, however, the circumstances are very different, for 99 per cent. of metal must first be removed before the carbon can be in a state to be attacked, and then, too, it exists, when separated from the iron, in two if not three different conditions, each of which has its effect on the process by which the element shall be finally brought into a form suitable for weighing.

At the outset, we have to choose between two courses. First, the direct combustion of the alloy and weighing the carbon as carbonic acid; second, the previous removal of the metal by some solution and subsequent combustion of the insoluble residue. Of the first of these paths, it may be said that though theoretically the straightest, it is in practice the least satisfactory, for the film of oxide of iron which immediately forms will protect the substance beneath it from further action unless particles of extreme minuteness be operated on, and chemists who have paid a great deal of attention to this subject say, that the more minutely divided is the metal, the greater will be the amount of carbon found. It has even been proposed to turn off fine shavings of hard steel by means of a diamond, as the best method of obtaining a sufficiently fine condition of metal. Now it is obvious that many samples of iron could not be mounted in a lathe and diamond turned, even if the costly tool necessary was always at hand, and filings, to quote an English author, "are lumpy little fragments which expose but a small surface in comparison with their mass."

The process by solution has the authority of many great names in its favor, but it is open to several sources of error. First, if there is free acid present, a portion of the carbon will escape as a gaseous or liquid hydrocarbon, and, in fact, no one of the usual solvents, cubric chloride and sulphate, or mercuric chloride, can be maintained in a liquid which is absolutely neutral to litmus paper. Second, bromine and iodine attack the iron readily, but leave, as Eggertz has shown, a residue containing carbon, iodine, silicon, etc., in a form which is not affected by washing or a heat under 250° C. If now this residue be burned, the iodine will escape and pass more or less completely into the absorbtion apparatus, and of course will tend to increase the apparent amount of carbon. Third, the character of the residue will vary according to the rate at which the metal has been dissolved. Caron and Crace Calvert have both shown that, when steel is treated for a long time by very dilute acids, a residue was left which was much greater in quantity than when the action of the acid was promoted by warmth or concentration. Fourth, Caron first established the fact that the physical state of the metal had an influence on the quality and quantity of this carbonaceous residue. According to him, 100 parts of steel of cementation leave by treatment with acid:

	Residue.	Carbon.
Steel direct from converter.....	1·634	·825
" hammered.....	1·248	·360
" hardened.....	·240	trace

So that the same sample of steel, which in its natural state shows nearly one per cent. of carbon, may show, when tempered, a trace only; and yet no one doubts that the same quantity of carbon really exists in the above three samples.

In view of these facts, the writer has given his preference to sulphate of copper as the solvent, notwithstanding the fact that it has been both strongly advocated, and also energetically condemned long ago; for it does not contain any substance which can be retained by the insoluble residue, and is therefore free from the objections which may be raised against iodine, bromine, and presumably chlorine and nitric acid; then, too, it can always be used in the same degree of concentration in water, and the amount of free acid, which is always very minute, can be reduced to a constant quantity by previous digestion with oxide of copper.

There is one detail, however, which the writer has found to be important. If the metal is not finely divided and is introduced in a cold solution of copper, the attack will be very slow, and local action occurring here and there, the copper will be deposited in adherent masses, which oftentimes may be ⅛ of an inch in thickness; as these are tough, they cannot be completely broken up by stirring, and the carbon thus enveloped will not be completely burned.

But if the metal is passed through a fine sieve and introduced cold into the liquid, which is then raised gradually to 80° C. on a water bath with frequent stirring, the whole residue will be in the form of a loose sponge, which can be filtered with the greatest ease on an ordinary funnel loosely plugged with asbestos, and, as the copper so largely predominates, there is no trouble in detaching the mass from the funnel after drying. Indeed, this forms one of the chief advantages of the sulphate of copper process; the carbon, being enveloped by porous sponge, is not disposed to run through any crevices in the filter, and the copper can be washed as easily as so much sand.

The carbonaceous residue thus obtained may be treated in two ways. First, by combustion at a red heat. Second, by Uligren's process, where it is introduced into a flask containing bichromate of potash and sulphuric acid. This latter method has been much used, but the writer is obliged to confess that he has not been able to realize harmonious results from it. This is very likely owing to want of skill, but it may be there is a valid theoretical objection to the method. It was stated above that the amount of carbon in the residue varied according to the temper of the steel, and the rate at which it was attacked. It has also been shown by several chemists that the untempered steel, and also that which was slowly dissolved, left a larger part of the carbon in the condition of graphite than did the samples otherwise treated. Now, as Brodie has oxidized graphite into graphitic acid by liquid oxidants at 100° C., it would not seem unreasonable to suppose Uligren's method liable to the same action, and hence that a part, or all of the graphitic carbon, might not be converted into carbonic acid, but remain behind as graphitic acid, in which case it would fail of being weighed with the absorption apparatus.

This objection may not hold in practice, the writer is not prepared to prove it, but the necessity of carefully watching the generating flask becomes quite onerous where a large number of analyses have to be made; he has therefore resorted to the method of combustion at a red heat, by modifying slightly the form of apparatus customarily used. A porcelain tube of about ¾ of an inch internal diameter is placed in a furnace, which will keep at least 10 inches in length of the tube up to a full yellow heat; a plug 2 inches in length is inserted in the anterior end; this plug is made by coiling up fine copper bell wire till it is just large enough to fit the tube closely; the interstices between the wires will always be large enough to allow of the passage of gas. Air being now drawn through the apparatus, the copper is deeply oxidized, and thus a filter of oxide of copper is produced, which at a red heat will oxidize any carbonic oxide or hydrocarbon which may pass over it.

To hold the matter to be burned, a copper boat is provided, which is easily made by folding up a piece of sheet copper; it should be about five inches long, and when bent form a half cylinder with closed ends; a few small holes may be made through the bottom with a punch, in order to make the vessel porous. On the bottom of the boat a stratum of asbestos is laid, and on this the mixed copper and carbon sponge is loosely placed. The anterior end of the tube containing the wire plug being first heated, the boat is then introduced, and the combustion conducted in the usual manner, either in purified oxygen or air. Air seems to answer perfectly, only, of course, more of it must be used than of pure oxygen; the most convenient method is to draw the air through by means of a water aspirator, and at the rate of six litres an hour. Operating in this way, I have not found any difficulty in oxidizing the carbon completely, even the graphite. This is probably from two reasons. First, the heat is a full yellow, much more than a glass tube could bear. Secondly, the carbon, being in a state of molecular division and surrounded on every side by particles of metallic copper, is sure to be burned as soon as the copper itself becomes oxidized.

When once the apparatus is mounted, it demands very little attention; the porcelain tube will last from ten to twenty times, and by having two boats, one may be withdrawn, and the other one inserted without cooling the tube, so that two combustions, including the weighings and calculations, may be made inside of three hours. The copper boats, if made of ordinary thin metal, will last five times before they become oxidized entirely through. As showing the result of the above method, which has been in use for the past year and a half, I will venture to quote a few out of a large number of analyses.

	Carbon.	Carbon.	Carbon.	Carbon.
A	1·065	D 843	C ·841	D ·896
	1·051	·828	·841	·871
Difference.....	·014	·012	·000	·025

A, B, C, D being different samples of steel. After making an aggregate of over sixty combustions, the maximum departure from the mean in various samples has been three-hundredths of 1 per cent., and the average departure from the mean is a trifle over one-hundredth, or one part in ten thousand of the metal operated on.

To recapitulate: the method described above consists in attacking the alloy, previously pulverized and sifted, by a solution of sulphate of copper, washing the mixed copper and carbon on a funnel plugged with asbestos, and finally burning the entire mass in a stream of oxygen or air in a porcelain tube maintained at a much higher temperature than can possibly be used with Bohemian glass.

The *Journal of Chemistry* warns the drinkers of water of wells near dwellings to beware of the typhoid poison, sure to be found sooner or later in those reservoirs, if any of the house drainage can percolate them. The gelatinous matter often found upon the stones of a well is a poison to the human system, probably causing by its spores a fermentation of the blood, with abnormal heat or fever. Wholesome, untained water is always free from all color and odor. To test it thoroughly, place half a pint in a clear bottle, with a few grains of lump sugar, and expose it, stoppered, to sunlight, in a window. If, even after an exposure of eight or ten days, the water becomes turbid, be sure that the water has been contaminated by sewage of some kind. If it remains perfectly clear, it is pure and safe.

The superintendent of the Passaic zinc mines, at Ogdensburg, N. J., a few days ago found a large garnet in the mine, for which he has been offered $50. There have been several smaller ones found, valued at from $10 to $15 each.

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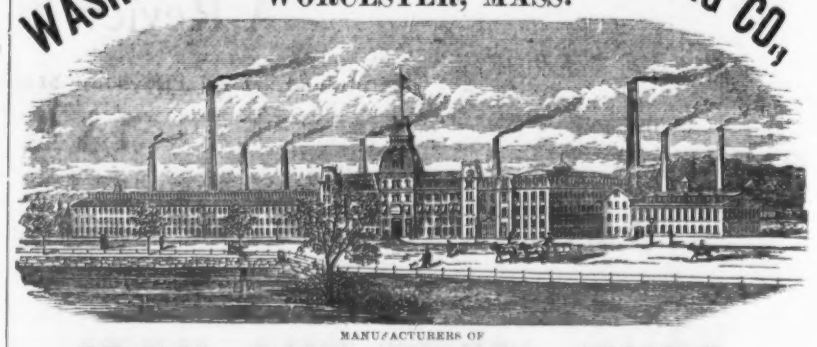

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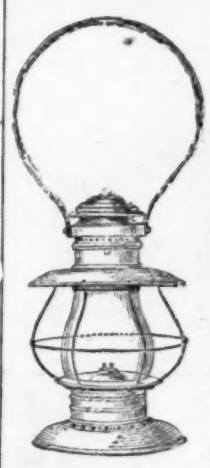

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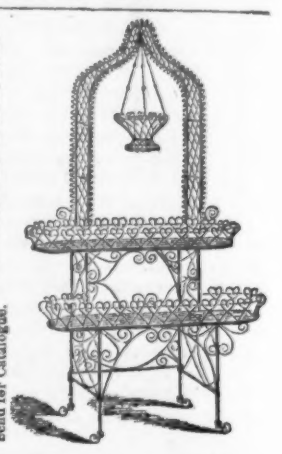

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Getting Ready for the Great Blast at Hell Gate.

The work of deepening and enlarging the East River channel at Hallett's Point is fast approaching completion, and it is now attracting the special attention of engineers and men of science throughout the country. Owing to the peculiar formation of the rock at Hallett's Point, together with the narrowness of the present channel and the almost uninterrupted passage of vessels, the work has been done under many disadvantageous circumstances. After a tedious work of nearly six years the task of excavating has at last been completed, and the secondary work of preparing for the grand blast is now going on. Inasmuch as the explosive power to be used on the final blast will be about 50,000 pounds of nitro-glycerine, or about eight times as much as has ever been simultaneously discharged before, much interest and not a little anxiety is being manifested in the result.

The work, which is being superintended by Mr. William H. Heuer, was begun in 1869, and the amount expended on it has been roughly estimated at about $750,000. The excavation extends under 2¼ acres of gneiss rock, vertically stratified and running in a northeasterly and southwesterly direction. Starting from a main shaft 34 feet below mean low water, ten main headings, sloping down to 52 feet below mean low water, have been extended out to an average length of 250 feet each. The hight of these main headings varies from 8 to 22 feet each, with an average width of 14 feet. From the main headings intermediate headings have been cut, and at uniform distances circular galleries have also been cut across the headings, thus forming a series of piers at their point of intersection. There are in all 173 piers, which form the entire support of the roof and of the water above it, and which also separate the 41 headings and 10 galleries. It is estimated that the entire amount of rock to be broken by the proposed blast will aggregate about 45,000 cubic yards. Since the completion of the excavation and the bringing down of the piers to an uniform size, the work of boring holes in the roof and sides has been begun. For this purpose six Burleigh drills are used daily, boring about 21 holes in 24 hours. The working force now engaged in this work is 120 men, divided into three gangs, each of which work eight consecutive hours, in order that there may be no cessation.

Captain Heuer expects to complete the drilling about the last of January, when the important work of charging each hole will be begun. This will have to be done by experienced workmen, with great care, and will probably occupy about two months. The explosives will be placed in iron tubes, each of which will have a direct battery connection, beside being connected with the adjacent holes by means of a series of small tubes filled with nitro-glycerine. This precautionary measure will be taken inasmuch as the experiment of discharging 6000 charges by means of one battery has never been tried, and by this system it is claimed that, although the battery should fail to ignite all the charges simultaneously, yet the discharge will, nevertheless, be instantaneous. It is expected that the blast—which it has been proposed to have on the 4th of July, 1876, in celebration of America's centennial—will entirely demolish the undermined 2½ acres of rock and break it into small pieces, which can afterward be removed by dredging. This will necessitate an additional outlay, as estimated by General Newton, in his recent annual report to the War Department, of about $450,000 for the next fiscal year. As regards the explosion of so large a quantity of nitro-glycerine, Captain Heuer does not anticipate that there will be any great shock to the neighborhood, nor that there will be the least danger attending the blast, as upon a previous occasion, when he fired a blast of 42,000 pounds of powder in the San Francisco Harbor, the only external visible effect was the elevation of an immense volume of water, whose transverse diameters were 300 and 250 feet, to a hight of about 150 feet. Here, as will be the case in the expected explosion at Hell Gate, the water was let into the tunnel, thus operating as a tamp.

Excavating is still going on at Flood Rock, although the work will be necessarily delayed until after the great blast at Hallett's Point is over. There are at present only about 10 men engaged upon the work. A shaft 60 feet deep has already been sunk, and two tunnels, each about 20 feet long, have been excavated, the one running across toward the New York shore and the other in the direction of Hallett's Point. It is thought that it will take about two years to complete the work, by which time nearly all of the obstructions will have been removed from the neighborhood of Hell Gate.

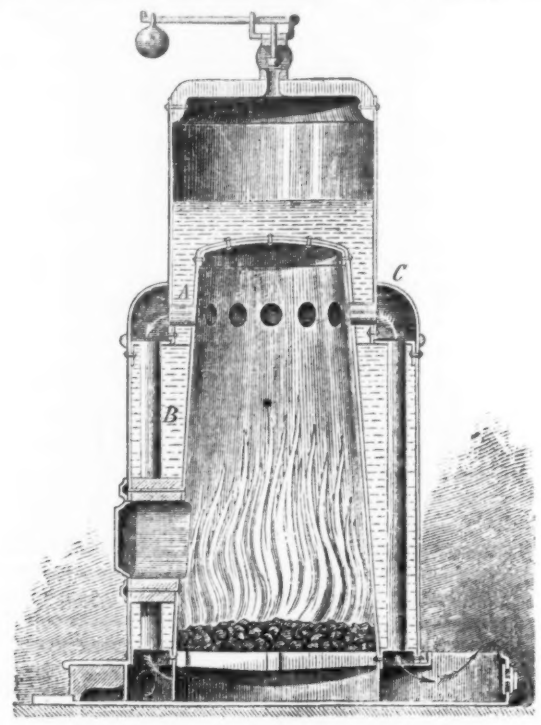

Fig. 2.—THE SHAPLEY BOILER.—(See page 1).

State Regulation of Railroads.

The following bill was introduced into the Wisconsin Legislature, March 14, 1867, and is a model for Granger legislation:

No. 464. A Bill to regulate the business of railroad corporations in the State of Wisconsin.

The people of the State of Wisconsin represented in Senate and Assembly, do enact as follows:

SECTION 1. There shall be a Board of Railroad Commissioners, consisting of one hundred and sixty-one members, who shall be appointed as hereinafter provided.

SEC. 2. Within ten days after the passage of this act the Governor shall nominate one hundred and sixty-one persons, citizens of the State to be Railroad Commissioners, and transmit the names of such persons to the Senate for confirmation.

SEC. 3. Said Commissioners shall be located by lot. The name of each station on the line of every railroad in the State shall be placed in a box; each Commissioner shall then draw a ticket from the box; the name thereon shall determine his future residence and field of operations.

SEC. 4. Each Commissioner, before entering upon the duties of his office, shall execute to the different railroad companies a bond in the penal sum of thirteen dollars, with not less than two sureties, to be approved by the farmers in the locality of their operations, for the faithful discharge of their duty, and shall also take and subscribe an oath of allegiance to the United States government.

SEC. 5. It shall be the duty of each Commissioner to ascertain, if possible, the amount of indebtedness of each road and the probability of their paying their debts; shall fix the price to be paid for wood by such corporation and the time when the same shall be paid; and shall make themselves generally useful in looking after the interests of these monopolies.

SEC. 6. The salary of each of these Railroad Commissioners shall be nine hundred and seventy dollars per annum, which shall be paid out of the school fund of the State.

SEC. 7. Said Commissioners, when thus appointed shall remain in office until removed by death, when their places may be filled as heretofore provided.

SEC. 8. In case of the death of the Governor, any vacancy in the Board may be filled by any conductor of a passenger train; provided, that no man shall be appointed who has ever been a member of the Legislature of this State.

SEC. 9. There shall be held in the city of Milwaukee, on the 4th day of July in each year, a meeting of the Board of Railroad Commissioners, who shall invite the officers of each and every railroad company in the State to attend for a general consultation on railroad matters; provided, that the Common Council of said city shall pay all legitimate expenses of said meeting.

SEC. 10. In case the Railroad Commissioners and railroad officers fail to agree as regards the duty of these monopolies, then in that case the subject shall be referred to the Supreme Court of the United States, whose decision shall be final.

SEC. 11. No person shall be allowed to ride as a dead-head on any railroad in this State whose usual weight is more than 132 pounds, and all persons who shall make applications to any person authorized to give passes, and shall fail to furnish such person with the official statement of the sealer of weights and measures of the town, city or ward where he may reside, shall be deemed guilty of swindling, and shall pay into the treasury of such railroad the sum of half a dollar for the first offence and sixty cents for each similar offence thereafter committed.

SEC. 12. This act shall take effect and be in full force from and after the 17th of March, 1867, and shall become like the laws of the Medes and Persians, to remain unchanged forever.

A destructive blast furnace accident lately occurred at the Hot Holes furnaces, Wolverhampton, occasioning the death of four workmen. The tuyere, whose destruction occasioned the explosion, had been repaired, but was sound. Some molten iron impinging upon the tuyere burnt through the boiler plate iron of which it was made, and thus allowed the water to escape into the furnace. The molten metal had got upon the furnace by there having been a sudden fall in the contents of the furnace after a portion of the completed iron had been run off.

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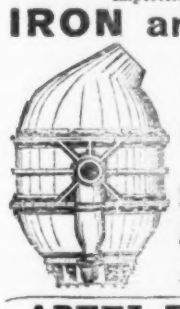
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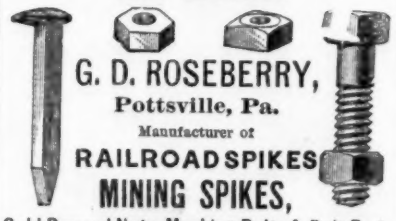
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New Patents.

We take from the records of the Patent Office in Washington the following specifications of certain patents lately issued, which will be found interesting:

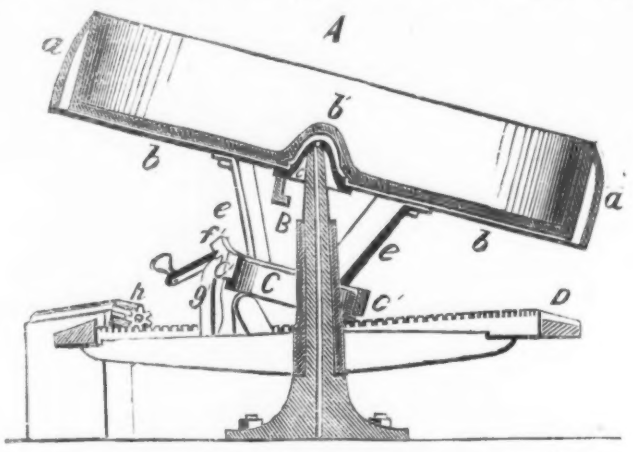
IMPROVEMENT IN TILTING AND REVOLVING PUDDLING FURNACES.

Specification forming part of Letters Patent No. 167,241, dated August 31, 1875, issued to Gordon W. Hall, of Havana, New York.

Figure 1 of the drawings is a longitudinal vertical sectional view of a tilting puddling furnace. Fig. 2 is a detail view, and Fig. 3 is a plan view.

This invention has relation to puddling furnaces wherein the process of puddling is conducted in hearths or basins which are moved by mechanical power for the purpose of agitating the melted metal, and facilitating the puddling operation.

It consists mainly in a boiling and puddling hearth or basin, which is mounted in such manner that a continuous circular tilting or wabbling motion is imparted to it during the operation of puddling, whereby the contained metal is more thoroughly agitated and exposed to the heat of the furnace, as will be hereinafter explained. The invention also consists in a puddling hearth or basin, which is free to be tilted and wabbled, in combination with means for adjusting the same at any desired angle from a horizontal plane, as will be hereinafter explained. It also consists in a hearth or basin which can be tilted, and which is centrally supported upon a hollow pedestal, in combination with water conduits and annular boshes, as will be hereinafter explained. The invention finally consists in certain novel means, hereinafter explained, whereby the hearth or basin can be rotated, adjusted in a horizontal plane, or held by means of a swivel hook, and caused to receive a variable tilting or wabbling motion without rotation, as will be fully explained hereinafter.



IMPROVED TILTING AND REVOLVING PUDDLING FURNACE.—*Fig.* 1.

In the annexed drawings, A designates a

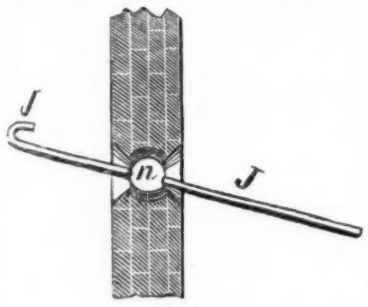


Fig. 2.

circular hearth or basin, which is composed of cast iron entire or in sections, and constructed with an annular hollow rim, *a*, radial water conduits, *b*, and a central elevation, *b'*. The conduits *b* communicate with and supply water to the rim or boshes *a*, and the central elevation *b'* receives in it a teat, *c*, which has a perforation through its apex, and between dent with the axis of the basin A, and the diameter of this ring is such as will allow the basin to be tilted at any desired angle. The segment *f* is held between guides and the segment *f*, which has teeth on its lower edge, is held between guides *g'*. The guides are rigidly secured to the spokes of a large horizontal bevel spur-wheel, D, which turns freely around the standard B and receives its rotation from a pinion, *h*, on a shaft which extends through the furnace wall, and is driven by means of a belt or spurred gearing. The guides *g'* receive between them a worm-screw, on the shaft of which a crank-handle is keyed for allowing it to be turned. The screw engages with the teeth on segment *f'*, so that by turning this screw the basin A can be adjusted in a horizontal plane, or set at any desired angle to such plane. The ring C, which is rigidly secured to the basin A by means of arms, as above stated, is free to turn inside of the band C', when not arrested by pivoted fingers *j*, which are applied to the band C'. When fingers *j* are turned inward and locked with the arms of ring C, then the basin A will rotate with the wheel D. J designates a rod having a hook, *l*, on one end. This rod passes through the wall of the furnace, and has a ball and socket bearing therein, which allows it to receive a universal play. The hook *l* is on the inner end of the rod J, and is designed to engage with one or the other of two hooks, *n*, on the bottom of the basin A, and prevent this basin from rotating, but allows it to receive a circular tilting motion from the wheel D. For the purpose of having the external surface of the rim of the wheel as close as possible to the wall surrounding it, said furnace is curved, and the adjacent surface of the furnace-wall is also curved. The furnace may be constructed in the usual well known manner, and with another slide for the balling tool in the ordinary sliding door, also an opening, suitably closed through the rim of the basin, for the purpose of tapping off cinders.

In practice the interior of the basin will be lined with a suitable refractory material (fix), and for this purpose use magnetic ore, or common ground ore (fix). The melted mass in the basin changes position from the bottom to the surface continually, thus thoroughly mixing the metal with the cinder and chemicals, and subjecting the same to the reverberatory heat of the furnace and eliminating all obnoxious gases, and thoroughly decarbonizing the entire charge in the basin.

Claim.—1. A central recessed boiling and puddling hearth or basin, mounted upon the stationary standard B, rounded at its upper end, forming a pivot, in combination with a suitable operating mechanism, whereby the basin has a continuous circular tilting or wabbling motion, substantially as and for the purpose set forth.

2. The adjustment screw K, combined with the segment *f'*, and a basin, A, mounted substantially as described.

3. The ring C, secured as described, to the basin A, in combination with the band C', segment *f f'*, guides *g g'*, and wheel D, substantially as described.

4. The hooked rod J, pivoted into the wall of the furnace, in combination with one or more hooks, *n*, on the basin A, substantially as described.

5. The teat *c*, having a perforation through its apex, combined with the basin A, hollow standard B, conduits *b*, and hollow rim *a*, substantially as described.

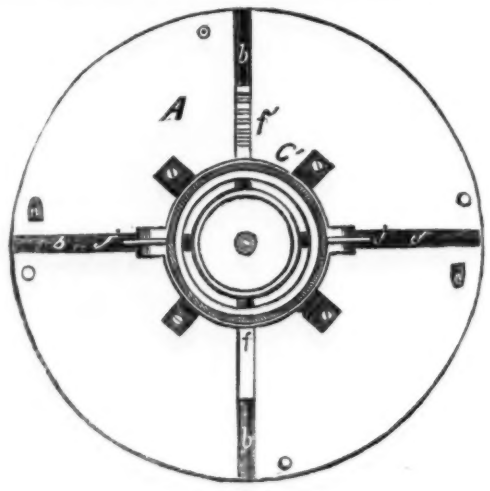
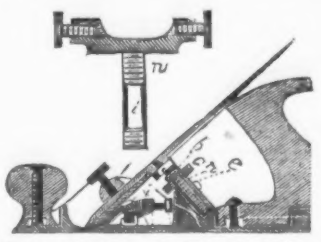


Fig. 3.

We take the following abstract of new patents, recently issued, from the official record:

BENCH PLANE.

To L. L. Davis, Springfield, Mass.—The bit is adjustable longitudinally by means of an abutting piece formed upon the base of the stock, and provided with an obliquely threaded socket, and a support upon which the bit rests, said support having a threaded pin upon its lower part, and operated by a thumb screw turned upon it. The bit is laterally adjustable by set screws provided with large flanged heads, and operating in bearings on either side of the support. The size of the throat can be changed by an adjustable wedge in rear of the bit, the whole secured in place by a set screw operating in a cross bar located in front of the plane iron.

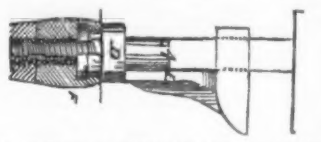


1. The combination of the adjustable support *b*, the lateral adjusting screws *a a*, and the screw E.

2. The combination of abutment D, the adjustable support *b*, the threaded pin *n*, nut *e*, the lateral adjusting screws *a a*, the wedge *f* and its screw *g*, and the clamping screw E.

WRENCH.

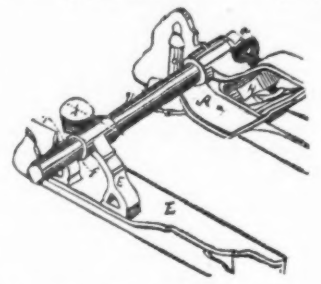
To Richard J. Welles, St. Joseph, Mo.—The handle H, threaded and movable on screw



shank, to form an adjustable jam nut to the revolving nut F'.

CARPENTERS' PLANE.

To Matthias C. Mayo, Boston, Mass.—1. The divided clamp C, provided with bearing C', slot

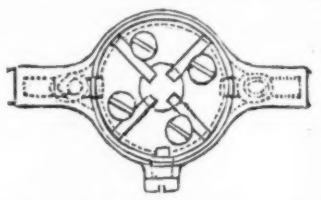


f, and clamping screw *d*, adapted to hold and embrace the arm D of a stock.

2. The combination, with the sword plate C, provided with a lip or flange, *s*, of the cutter *b*, pivoted clamping lever H, provided with concave enlargement *a'* and adjustable gage E.

DIE-STOCK.

To John J. Grant, Hartford, Conn.—1. The combination of the bolts *b* and the shoulder *h*

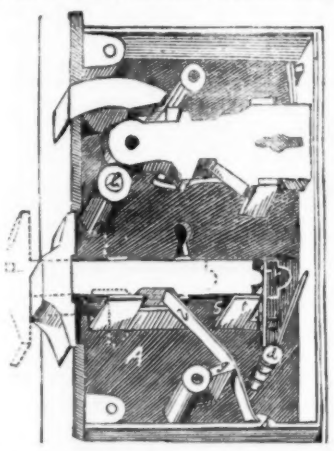


with a die-stock, for the purpose of securing the die in its place when in use.

2. A die-stock with a circular collet or disk, held in place by spring bolts and slot and pin.

LOCK FOR SLIDING DOORS.

To Thos. Lyon, Hartford, and Emery Parker, New Britain, Conn.—1. In combination with lock cases for sliding flush doors, an extensible draw bar, *a*, having its head projected beyond



the front plate to form a thumb piece, by which it can be extended, but arranged to be sheathed within the case when the edges of the sliding doors are brought into contact.

2. The combination, with an extensible draw bar, *a*, as described, of a friction stop spring *b*.

It appears that powerful competition of foreign rivals in the ship business has had the effect of seriously reducing the domestic carrying trade of Great Britain. In the shorter timber trades, British ships, so it appears from the *Nautical Magazine*, can no longer compete with foreigners, for the foreigner has the trade, which he can carry on without interruption. Another import industry is also slipping out of the fingers of Great Britain. Numbers of British sailing ships that were till recently employed in trade with the West Coast of Africa have been transferred, and no more are going. Another feature worthy of note is that Liverpool, which was recently the seat or entrepot of the palm oil trade, will soon be so no longer. That port will now only receive such cargoes of oil as may be brought by the large steamers. The sailing vessels are being taken off the Liverpool trade, in order to run between Havre or Hamburg and the West Coast.

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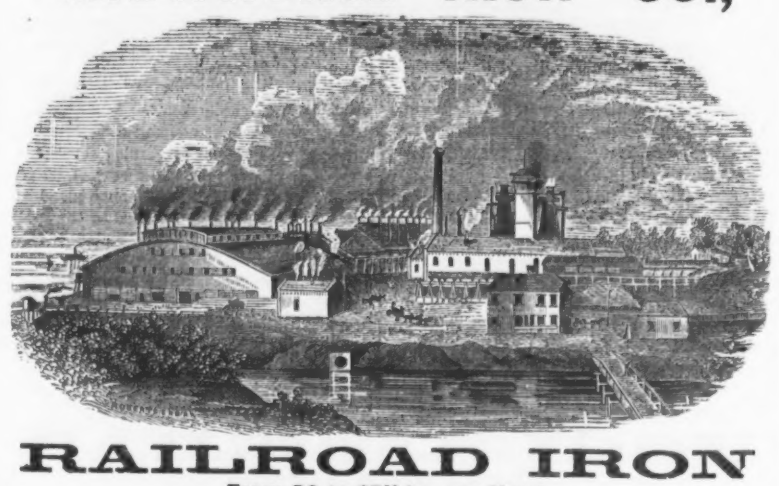

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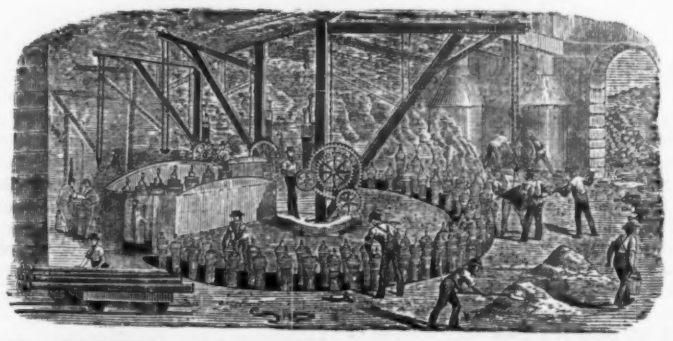

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The Construction and Management of Roll Trains for the Manufacture of Heavy Bars, Rails and Girders.

BY WILLIAM HEWITT, M. E.

PART II.—*The Common Mill.*

Before proceeding to consider the later systems and more recent improvements in rolling mill practice, it will not be out of place to give a short description of the ordinary "two-high" train, and to take a brief survey of the more common features of roll trains in general. The common "two-high" trains was until within a few years the train employed for all kinds of rolling, but it is now confined almost exclusively to the manufacture of flat bars for rail and beam piles, merchant bars, and fillets for wire rods, and even for these purposes it is rapidly being superseded by the later styles.

In this train one or more pairs of rolls are connected together, and the piece of metal requiring to be rolled is passed between the rolls of the first pair, and is then lifted over them to the other side, and again passed between them, which operation is repeated in the successive pairs, until the metal is brought to the required shape and dimensions.

For bar iron the rolls have grooves cut in them, so that when placed in position the corresponding grooves in each roll are directly opposite each other, and produce, along their line of nearest approach, circular, rectangular, or any other sections according to the shapes which we wish to give the iron. These rolls have their axes in the same vertical plane and turn in contrary directions. In the "small mill," sets of three rolls, one above the other, are employed. In this arrangement the middle roll turns in a contrary direction to the other two.

The rolls present three distinct parts: the body, the journals, and the ends, or "wabblers," as they are called. The latter are grooved in order that they may be connected with the neighboring sets of rolls by means of spindles and coupling boxes.

The rolls are supported between "chucks" enclosed in the housings. Each housing is supplied with a large screw, having a lever or handle for communicating motion to it. These screws, which pass through large nuts fitted in the caps of the housings, press on the chucks immediately above the upper roll, termed the "riders," and serve to hold them in position, while the metal is passing through the grooves. The distance between the rolls is regulated by wedges placed under the "carriers" or supporting chucks. The position of these wedges is generally fixed by hand, but they are sometimes made adjustable by means of screws.

The housings are secured very firmly by strong bolts and pins to a large cast iron bedplate, bolted to the foundation. When, however, longer or shorter rolls than those already in use are desired to be employed, the housings are so arranged that they can be removed or brought closer to each other without difficulty. Mr. James Moore, of the Bush Hill Iron Works, Philadelphia, makes an excellent arrangement for this purpose, but a description of it would here be out of place.

The dimensions of the rolls and other parts of the train vary, of course, with the dimensions of the iron to be rolled. A heavy rolling mill consists of two sets or pairs of rolls, distinguished as the "roughing" and "finishing" rolls. In the 12 and 8 inch trains, however, three, and very often four, sets are employed. A good rule with regard to the arrangement of the sets of rolls in a train is to place those which have to bear the greatest strain nearest the prime mover; but the order usually adopted, irrespective of which set has to bear the greatest strain, is, first, the pinions, then the roughing, and lastly the finishing rolls. In the small mill, however, a set containing open-square and oval grooves, is interposed between the roughing and finishing sets. These or the "finishing ovals" as they are called, are employed only in rolling round wire rods; the last groove merely pressing the oval rod into a round one, with but a slight reduction in the area of the cross section.

The different sets of rolls are connected with each other by means of spindles and coupling boxes. The spindles are grooved like the wabblers, and the coupling boxes act as sleeves for receiving the ends of each and binding them together. Wooden pieces are tied in the grooves of each spindle to maintain the separation of the coupling boxes. As the coupling boxes are easily replaced, it is considered a good practice to so construct them that in case of any extraordinary strain upon the train they will break before any other part. This was formerly done with the spindle which coupled the driving shaft to the pinions; it was weakened by being turned down, and called from this fact the "breaking spindle." But this has almost entirely gone out of use on account of its cost. The spindles and wabblers ought to have a play in the coupling boxes of about one-eighth inch, so that the rolls may undergo slight derangements without breaking them, but principally in order that the rolls may be used after they have become worn below their pitch lines.

At the end of the train, nearest the prime mover, are placed the pinions, mounted in housings similar to those of the rolls. These also present three parts; the body that bears the teeth, the necks and the wabblers by which they are coupled to the roughing rolls on one side, and to the prime mover on the other. When the roughing rolls are "three high," as in the small 8" train, it is preferable to couple the prime mover to the middle pinion, as the backlash and liability to breakage is much less, although in some mills they are driven very successfully from the bottom pinion.—*Miscellaneous Rolling Mill Information. By Lewis & Rossiter, No. 9.*

The teeth of the pinions are set within discs, or webs, at each end, which are nearly of the same diameter as the pitch circles. Formerly the pinions were fastened directly to the rolls, but this was very objectionable and the source of a great deal of trouble, for, the wheels being once accurately centered, would gradually work themselves out of their position of true gear as the rolls wore, and even without regard to the wear of the rolls, it necessitated a fixed distance between them for every pattern of bar. The adoption of the present mode of mounting the pinions in separate housings, and thereby making them independent of the rolls, was, therefore, an important step in the progress of rolling mill construction.

The arrangement by which the train is coupled to the driving shaft of the prime mover consists of a clutch called a "crab," which is composed of two pieces so constructed that the train may be disengaged without entirely stopping the engine. One piece, which is bored out, and keyed fast to the driving shaft, consists of a thick disc having segmental projections on its face called "horns." The other, which is movable along the "breaking spindle" (still so called from its formerly having served as such, but now one of the strongest parts of the complete machine), consists of a coupling box with horns on one end, which fit in between the horns of the disc on the driving shaft. These two pieces may be engaged or disengaged by means of a forked lever, the prongs of which pass within a groove turned in the movable piece.

In order to facilitate the entering of the bar in the various grooves, wrought iron pieces with steel edges called "rests" are placed in front of the rolls nearly but not quite to the height of the bottom of each groove. Sometimes plates are laid over these for a portion of the whole length of the rolls, or the whole is made in one solid piece. On the side of the rolls, where the iron leaves the grooves, are placed other pieces called "guides," with grooves in them of the same shapes as the grooves in the rolls to which they correspond, but made a little larger in order that the bar may pass along them easily. The object of the guides, as their name implies, is to direct the iron from the rolls and prevent it from winding around them or "collaring," as it is termed. In the 8" train, where the grooves are small and close together, guides are employed in the place of rests, in order to insure the entering of the rod in the right groove, and, moreover, to guide the rod horizontally into as well as out of each groove, because if this is not done the rod will be more or less flattened and untrue in section. A train fitted in this manner is called a "guide mill." Flat bars and plates require simply plain flat guides. In the beam and rail mill there are, beside the rests and guides, cast iron pieces to the right and left of each groove called "side guides," for the purpose of preventing the iron from bending sideways, which is very often the tendency in rolling bars of unsymmetrical sections, or bars that have been unevenly heated. In rolling bars of grooved sections, like those of a beam or trough bar, wire brushes are sometimes placed behind the grooves, for the purpose of removing the scale or film of oxide which collects on the upper side.

In rolling heavy bars, such as rails and beams, a workman, at each passage, receives the iron as it leaves the groove, and returns it over the top roll along the groove which it next engages. As soon as the iron is freed from the rolls, therefore, it must be lifted to a hight equal to the diameter of the top roll, and for this purpose it is received on levers with hooked ends, suspended by chains from pulleys which are free to roll along iron bars fastened to the framework of the building.

Along the top of the train is a trough containing running water. This is pierced with small holes, or has small pipes leading from it to the journals, in order to convey the water to them and prevent them from becoming too hot and cracking. Where the bodies of the rolls are liable to become heated by contact with the hot iron, the water is allowed to trickle over them, and it not only serves to keep them cool, but also to clean the hot bar or plate, by bursting into steam and spattering the scale. The roughing rolls, however, are seldom watered while the iron is in them, as the "roughers" usually have to work so close to the rolls th the spattering o the scale would inconvenience them

The housings are cast of the most homogeneous iron that can be obtained, and made strong enough to resist all the strains and shocks that are liable to be brought upon them Formerly they were set directly on timber or masonry, and were ill-adjusted and unstable. In the new practice, the housings and "shoes" on which they rest are accurately planed together. In the older forms the top was removable to facilitate changing rolls, but this interfered with strength and solidity. They are now made of sufficient hight and width to permit changing rolls from the front or rear, and are accurately fitted to the movable chucks that hold the rolls and give them firm lateral support.—*Engineering, May 8, 1874.*

The fitting of the rolls still remains to be described. In the plate mill, the rolls being plain cylinders, the same part of them may be used for all the passes, the change of figure being produced simply by narrowing the space between them vertically at each pass. For this purpose the top roll may be moved toward or from the bottom roll by means of the screws with which it is kept in contact by counterweights.

In rolling rounds and squares the grooves are turned half in each roll, and in order to prevent the rolls from moving laterally and disarranging the grooves, the brasses which press against the bodies of the rolls are regulated and held by screws in the housings which bear against the chucks.

In rolling rails, beams and flat bars, the top roll is provided with a series of projections, and the bottom roll with a series of recesses for receiving these projections, and combining thus with the top roll to form the required set of grooves. The projections on the bottom roll are called "collars," and the roll itself the "collared roll."

Fast Mails.

A writer in the *World* says: Fast and slow are arbitrary terms! It was fast in the past, when Thorpe and Sprague and Faxon and Butterfield and Coe and Sherwood sent over the turnpike the telegraph line eight miles the hour, and limited to six passengers. It was position to be one of that six. "I will tell you," said a gentleman, when he wanted to describe the social standing of young Wadsworth—he was young then; we know him as the General Wadsworth dying in the civil war—"I will tell you what he is," he said; "they will take him as the seventh passenger in the Telegraph line!" Four miles or three and a half on the packet boat was not fast, but it was ever, ever so comfortable—indeed, after the surging sea of the spring thawed roads, it was luxury. The delay was as nothing compared to the relief of thus gliding on, calm, dull, dozy and peaceable; but the Waverly books were not ancient literature in those days, and the pace was one which admitted of an enjoyment that found the journey only too brief.

Turn to the files of the *Evening Journal* for 1836, and you will find an admirable editorial by Thurlow Weed, describing exultingly the opening day of the Utica and Schenectady road—to Utica and return in one daylight! That *was* fast. To enjoy it by the test of contrast, it should be read with Governor Clinton's narrative of his tour in a batteau, or "Durham boat," up the Mohawk, searching out the canal quesquestion. It is very comical now, but it was tragic enough then to remember that long after the Utica road opened, the passengers westward were detained two hours in the dead of the night at Utica to wait till the locomotive could return from Syracuse. We gather these quaint memories in this day as the ladies select their oldest china to place in their parlors. The tinge of ancient flavor about them is refreshing as a safe sentimentality. It is no longer a disturbing fact.

I suppose that the Postmaster General, if he looks over old schedules and makes contrast with the fast mail's time table, says, as one of the Liverpool and Manchester railroad directors did when the Rocket told even England's blooded race horses that their day was over: "How *has* George Stephenson delivered himself!"

A Water Motor.—At the Sulzbach, Altenwald Colliery, near Saarbrucken, Prussia, machinery has been established for the transmission of power from a steam engine at the surface, by a column of water circulating under pressure, the circumstances of the case not admitting of the establishment of a direct acting steam pump under ground. The mine is sunk 306 yards below the surface. The piston rod of the high pressure engine above is connected with the pressure plungers, each of which plungers is connected with the underground engine by a tube filled with water. The last mentioned engine consists of four pressure pumps arranged in pairs, and between each pair is placed the working plunger of one of the mine pumps. When the engine on the surface acts, the power is transmitted by one pressure plunger through one water tube to a pair of pressure pumps under ground, and thence to one working plunger, which either aspirates or forces air, according to its position. The opposite pair of pumps and connections work conversely. The water is forced into an air vessel, and thence through the rising main 303 yards in hight, in one lift to the surface. On the change of stroke, the water in the cylinder of the pressure pump rises in the second water tube and follows the retiring pressure plunger at the surface, the power supplied by the descent of water in one column being sufficient, with the exception of a slight allowance for friction, to effect its return in the other. If the cataract pauses of the engine at the surface are not too long, the discharge is practically continuous. The *Engineering and Mining Journal*, from whose translation of the German description the above is condensed, adds that at the Phœnix mine, in Cornwall, England, an arrangement of similar description, consisting of a plunger attached to the main pumping engine, connected by a length of tube with water pressure engine in another shaft, has been at work for the last ten years.

The number of lives lost from wrecks, casualties and collisions, on or near the coasts of the United Kingdom, during the year 1873–4 was 506. This is 322 less than the number lost in the six months ending June, 1873. The lives lost during the year 1873–4 were lost in 130 ships; 87 of them were laden vessels, 40 were vessels in ballast, and in three cases it is not known whether the vessels were laden or light. Ninety-five of these ships were entirely lost, and 85 sustained partial damage. Of the 506 lives lost, 61 were lost in vessels that foundered, 76 through vessels in collision, 200 in vessels stranded or cast ashore, and 101 in missing vessels. The remaining number of lives lost, 68, were lost from various causes, such as through being washed overboard in heavy seas, explosions, &c. Nine of these lives were lost in wrecks or casualties which, although they happened before July, 1873, are included in these returns, the reports having been received too late for them to be included in the returns for the first six months of 1873. The 293 lost through the sinking of the ship Northfleet will account for the number lost during the first six months of 1873 so far exceeding the number lost during the whole year 1873–4.

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Pawtucket, R. I.

The American File Company have the exclusive right to use the Bernot process for cutting files By this method all the advantages of hand cutting are secured, together with an accuracy unattainable in hand work. They are the only manufacturers who employ machinery for testing files and steel.

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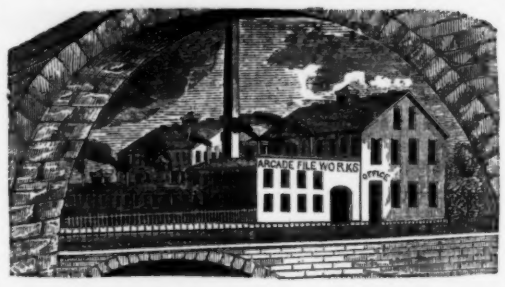

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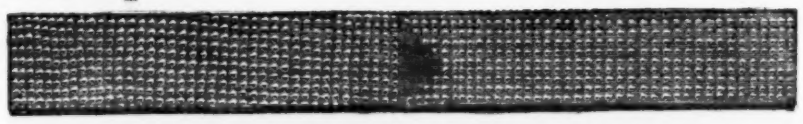

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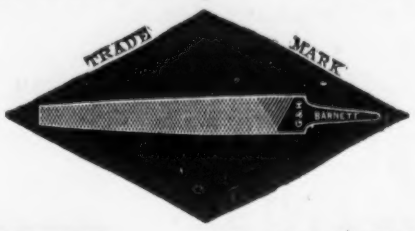

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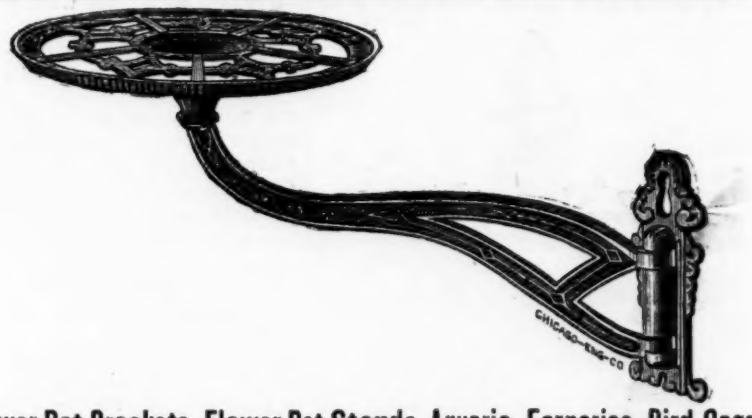

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BUSINESS ITEMS.

NEW YORK.

The Rome *Commercial* says that the Woodstock Iron Company have began to make "spiegel." Their ore bank, which is very rich, is located near their works. They have already received orders for their production.

The Elmira Iron and Steel Rolling Mill Company are preparing to start up their blast furnace.

Weed & Becker's axe factory, at Cohoes, the principal part of which was destroyed by fire, is now rebuilt, the machinery in order, and running day night to supply the orders that arrived while they were shut down.

NEW JERSEY.

Two new furnaces have been blown in at Cromwell, Lebanon county. They belong to the heirs of R. W. Coleman. The North Lebanon Furnace, at Lebanon, belonging to the Hon. G. Dawson Coleman, has also been blown in.

PENNSYLVANIA.

The Connellsville Machine and Car Company is extending the capacity of its works, and is full of orders. The works are now employed on the iron work for two bridges over the Casselman River, on the ore cars and a passenger car for the Green Lick narrow gauge road, and have orders beside for coal pit cars, coal shaft and furnace machinery.

There seems to be a prospect that the Kittanning rolling mills will resume operations. The old limestone well on the McNab farm, three miles north of the town, has come into the control of the iron men, who intend to have it cleaned out, and if sufficient gas is obtained, it will be conducted to the works and used for heating purposes.—*Pitts. Com.*

An order has been issued for the construction, at the Altoona shops, of 24 additional locomotives for the use of the Pennsylvania Railroad. In order to complete them at as early a date as possible, additional workmen will be employed and the hours of labor increased. Some of these engines will be for freight traffic, and others will be used as passenger locomotives.

A mammoth piece of hoop iron, measuring over 120 feet long and 8 inches wide, number 8 gauge in thickness, was rolled in the Lewis, Oliver & Phillips mill, Pittsburgh, the other day, for the Exposition.

The Keystone Bridge Company recently completed an iron bridge 163 feet long for the New Jersey Central at Kimmet's Lock, near Catasauqua, and is now erecting another one, 156 feet long, near the same place.

The Lebanon rolling mills have at present 153 men employed, and the mills are running day and night. There was more iron turned out last week than at any other time previous.

The Huntingdon Car Works now employ about 69 men, and are running on contracts for the Pennsylvania Railroad and for a railroad in Cuba.

The Palo Alto Iron Company's mills, in Pottsville, which have been idle for over a year, have resumed operations, about 300 men being employed, at a reduction of 25 per cent. from the former rate.

Messrs. Robinson, Rea & Co, 12 Smithfield street, Pittsburgh, are manufacturing Farrelly Allen's "triple cylinder compound balance piston engine." This is a 3 cylinder compound engine, with cylinders in line on one piston rod, or else side by side. The high pressure cylinders are single acting, taking steam at one end only. These pistons make the return stroke without back pressure, as the exhaust steam circulates on both sides of them. This style of compounding is applicable to both high and low pressure engines, and to locomotive, stationary, marine, or pumping engines. It is claimed that it saves half the boiler and half the fuel at high pressure, or nearly double the power of steam when compared with the single cylinder.

The Standard Steel Works, near Lewistown, are doing well. At this establishment crucible steel tires are a specialty, but it has also facilities for supplying crucible steel axles, forgings, castings, etc., etc. Over 8000 tires have been supplied from these works under their present management, since January, 1873. The office of the company is at 218 South Fourth street, Philadelphia.

About a year ago Isabella furnace No. 1, at Ætna, Allegheny county, received much attention throughout the country for its remarkably large yield of pig iron. The Isabella Furnace Company own two stacks, and since last April No. 1 has been blown out and No. 2 put in blast. It has been gradually improving since it was started, and the week ending October 16th it surpassed the largest reported yield of the famous No. 1. The largest yield of No. 1 was the week ending November 7, 1874, when 702 1220-2240 tons of pig iron were made, while the largest yield of No. 2 was the week ending 16th inst., when 714 1240-2240 tons were turned out. Of this 112¼ tons were made in one day. One-third of the iron was No. 1, and the remainder No. 2. This beats all other furnaces ever reported. It should be mentioned, however, that No. 2 has a 20 foot bosh, while No. 1 is but 18 feet in diameter at the bosh. Each stack is 75 feet high.

The *Bulletin of the Iron and Steel Association* publishes the following items respecting the Edgar Thomson Steel Works: We are indebted to Capt. Wm. R. Jones, Superintendent of the Edgar Thomson Steel Works, for a nickle plated sample of the first rail rolled at the works, September 1st, 1875. It is of the Pennsylvania Railroad 60 pound pattern, and its shape and quality appear to be perfect. We have received from the company a section of a twisted rail made from the product of their first blow, August 26, 1875, which we will place on exhibition in our office. The rail was twisted cold, and our piece of it is in shape very much like an auger, showing conclusively, as a well known authority has stated, that "some things can be done as well as others." During the month of September there were rolled at these works 1112 1950-2240 tons of Bessemer rails, the mill running only single turn. At the Tradesman's Industrial Exposition, at Pittsburgh, there is exhibited a steel rail rolled at Edgar Thomson which is 62 feet long. On the 5th inst. 26½ tons of steel rails were rolled. No difficulty has been experienced in operating successfully all the departments of this new and eligibly situated establishment. The company is making rails for the Northern Central Railway Co., of Pennsylvania, the Pittsburgh, Cincinnati and St. Louis Railway Co., and the Allegheny Valley Railroad Co.

MASSACHUSETTS.

Smith & Wesson have contracted to furnish the Russian government 20,000 more army pistols, the pattern to be No. 3 with ejectors, and the work will probably be done in something less than seven months. It is proposed in the spring to built an addition, 100 feet long, to the wing on the south part of the building, to accommodate machinery for the manufacture of pistols similar to the new ones now being made, but of smaller calibre.

But few men are employed in the Boston and Albany car shops at Springfield, but they are kept well employed. Eight new box freight cars have been turned out, and enough repairing is needed to keep many more hands busy.

Clark & Chapman, of Turner's Falls, have just finished a 54 inch wheel for the Ludlow Manufacturing Co., at Jacksville. Business at this mill, as well as in the others, continues quite good.

The Kitson Machine Company, of Lowell, continue to keep their full force of 180 men busily at work filling orders for their patent compound opener lappers and finisher lappers; also shoddy pickers, needle pointed card clothing, etc. They are also filling large orders for Wamsutta Mills, New Bedford; Lockwood Company, Waterville, Me. The Kitson Machine Company have recently invented and patented some valuable improvements upon their openers and lappers, among these improvements being a new "elastic beater," new friction brake, oil boxes, etc.

CONNECTICUT.

Horton's chuck mill, at Windsor Locks, which was idle for two months during the warm weather, is now running with over half its full force.

New Britain capital is reported to be invested quite largely in the new lock company at Bridgeport. The concern is to be known as the Bridgeport Lock Company, and has a capital of $100,000. The president and principal manager is N. G. Miller, formerly president of the Eagle Lock Company, of Terryville. Nathaniel Wheeler, of, Bridgeport is largely interested. Work has already begun on their 125x40 feet building. This, and the new Sharp's rifle factory, now nearly completed, will make things livelier than ever in Bridgeport.

OHIO.

The Novelty Iron Works, Cleveland, have just completed the iron work for the new jail at Coldwater, Mich. They have 3 iron roofs and 12 bridges, one of them 312 feet span, for the Kanawha River, in course of construction, and are running to their full capacity.

The United States Rolling Stock Company has contracted with the Urbana Machine Works for 100 tons of castings, to be used in repairing cars.

The Cincinnati Iron Bridge Company have just closed a contract to erect one of their truss bridges in the State of New Jersey, in a neighborhood where they have heretofore built several.

The new furnace of the Iron and Steel Company, Ironton, is working on half coke and half Ashland coal, and using native ore, Iron Mountain, Mo., and Crawford county, Mo., ore one-third each. She is now making 51 tons of iron per day.

The Cleveland Spring Works are running to full capacity.

Ballard, Fact & Co., of Canton, in order to fill the large demand on them for springs, have been compelled this summer to erect new shops. They will run the same with a separate engine of 100 horse-power, and there manufacture 150 pair of carriage springs daily. In the old shops, with an engine of equal power, they will manufacture daily 400 pair of seat springs, 200 reaper knives, hay knives, &c., and saws without limit, making the total business nearly a half million annually. Manufacturing in these varied lines enables them to keep busy, notwithstanding the "general depression."

The Lake Shore Mill, of the Cleveland Rolling Mill Company, is running on iron rails for its Cincinnati Southern contract.

The Forest City File Works, Cleveland, A. H. Moore & Co., are furnishing large numbers of new files to the A. & G. W. Railway Company, and have an immense trade in recutting files for the various railway and other metal working establishments. They have large orders ahead for their goods.

Homer, Hamilton & Co., of Youngstown, are erecting a hoisting house for the Himrod Furnace Company, the girders and columns of cast iron.

The Variety Iron Works, Cleveland, employ 75 hands and are doing a large business, work the shops to their utmost capacity. They have recently built three large revolving gravel heaters, with horse-power attachments, for the Cleveland Paving Company; a large water box, 60 feet long, for the Forest City Varnish, Oil and Naphtha Company; one large tank for Marsh & Harwood's acid works, beside numerous other smaller orders. The four 48-inch heating boilers for the city buildings, with elegant fronts, after a special design, have recently been set up.

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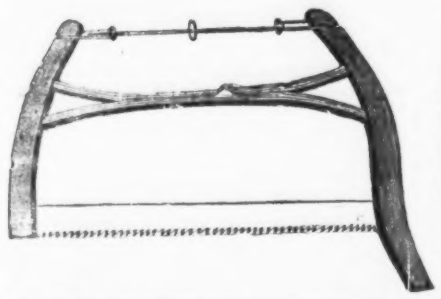

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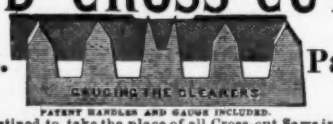
$1.50 Per Foot.



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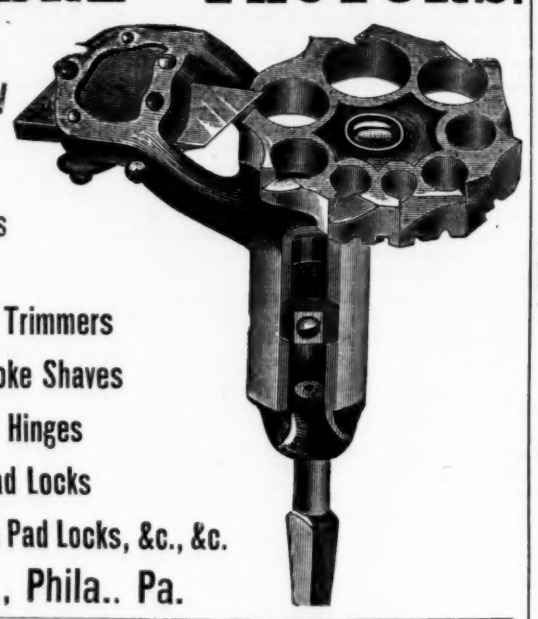

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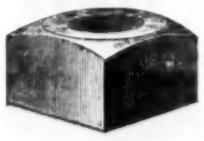

HOT PRESSED NUTS

Of Superior Quality of all sizes, both

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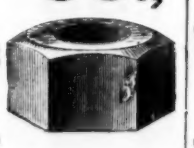

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Of every description, including

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Manufacturer of

Saws of all kinds.

Also Sole Manufacturer of

LIGHTNING SAWS.

Two Direct Cutting Edges, instead of one Scraping point.

Note extra steel and durability over the old **V**, outlined on **M** tooth.

Telegram Dated Oct. 1st, 1874.

STATE FAIR, EASTON, PA.

TO HENRY DISSTON & SONS:

Philadelphia, Pa.

I want you to publicly test that challenge on Cross Cut Saws. Name time and place within thirty days. American Institute preferred. E. M. BOYNTON.

Henry Disston & Sons, dare not respond.

E. M. Boynton gave on Wednesday of last week an exhibition of what his Lightning Saw could do at the Pennsylvania State Fair, in which two men sawed through a sound oak log, 16 inches in diameter, in 17 seconds. Mr. Boynton informs us that his export trade is increasing, he having lately made large shipments of his saws to Australia and other distant markets.—*The Iron Age*, Oct. 8, 1874.

For fuller report of this exhibition see the *Easton Morning Dispatch* of Oct. 1st, 1874.

Henry Disston & Sons cannot furnish Lightning Saws. Why do they imitate mine?

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Manufacturer of

ALL KINDS OF

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And Plastering Trowels,

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Manufacturers of **Measuring Tapes,**
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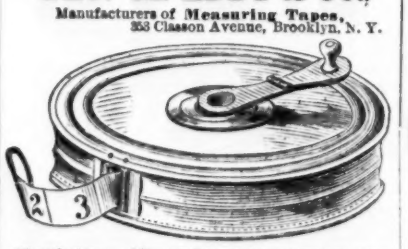

Manufacturers of Paine's Patent Steel Standard Measuring Tapes, for Surveyors, Engineers and Mechanics requiring a correct measure of great length according to U. S. Standard. Also of Tape measures for the same trades, Lumbermen, Machinists, Tailors, Shoemakers, Dressmakers &c. Catalogues on application.

make a specialty of the LARGEST SIZES of **Circular Saws**, and call particular attention of lumber manufacturers to the following points of excellence:

Evenness of Temper.—The peculiar structure of my furnace subjects all parts of the saw to a DEAD heat, and when dipped in the oil bath secures perfect uniformity.

Perfect Accuracy in Thickness.—My saws are ground on a patent machine, automatic in its operation, grinding off the thick places upon the plate before the thinner parts are reached, and when the saw is removed BALANCES PERFECTLY, which is proof positive of the right accomplishment of the work.

Properly Hammered.—Great care is taken that no saw shall leave my works without due attention in this important particular. A saw too tightly strained upon the rim, or too loose in the center, cannot be successfully run—hence the importance of so hammering the saw as to effect equal strain in all its parts, and at the same time RUN TRUE. This department is under the personal supervision of myself, who has devoted over *twenty years* to the art of saw making.

I am sole proprietor and manufacturer of the celebrated **"Challenge" Cross-Cut Saw.** Price Lists of all kinds of saws sent on application.

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VAN WART, SON & CO.

Hardware Commission Merchants.

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For Sale by all the principal Hardware Dealers.

Malleable Iron Castings

Of Superior Quality made to order.

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This Wrench can be furnished with Briggs' Pat. Nut or Sleeve.

PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, Case-Hardened throughout, and not only combine all of the superior qualities of our cylinder or Gas Pipe Wrenches, but also all requisite Combinations of a regular Nut Wrench, thus making a Combination which has no equal. For Circulars and Price List, address,

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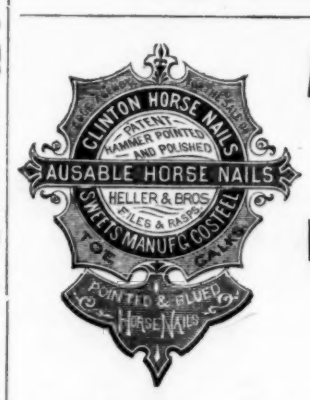

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Hammer Pointed, Polished & Blued

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Orders promptly filled at lowest market rates.

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Pointed, Polished & Finished Horse Shoe Nails.

Recommended by over 20,000 Horse Shoers.

All nails made from best NORWAY IRON, and warranted perfect and ready for driving. Orders filled promptly and at lowest rates by

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PHILADELPHIA CORRESPONDENCE.

PHILADELPHIA, Oct. 25, 1875.

The week past has been one of considerable and varied excitement, the principal of which was the visit of the Western and Northwestern delegation of merchants, bankers, governors *in esse* and governors *in posse*, divines, dead heads, etc., to the Centennial grounds and buildings, and to this and Centennial matters must my space be devoted. The project of bringing the representative men of the great West and Northwest to see for themselves the magnitude and beauty of the preparations made for the coming exhibition, was one of the wisest which has yet been formed by the managers, and will undoubtedly bear good fruit and quickly. The entire details of the plan, which was comprehensive to a degree, and purely American in idea, were carried out to the letter. It was no small undertaking to bring several hundred guests from a distance of over 1000 miles, to lodge, feed, entertain and provide for them, and send them to their homes perfectly and thoroughly satisfied with their treatment, and enthusiastic in the support of the object for which they were brought, and yet it was done, and well done. Two large trains, exclusively of Pullman coaches, brought the Western men, who had throughout their journey all the accommodation of this excellent system of railway transit, and who, in addition, took their meals *en route*, a commissary car being attached at different points, and the guests accommodated with all the comforts of a first-class hotel breakfast and dinner. Whatever we *cannot* do in the railway line as against our English cousins, this much we *can* do, which they cannot, viz: dine a train load of passengers while running at the rate of 40 miles the hour. On their arrival the Centennial guests were fittingly received and provided with hotel accommodations, first receiving the salute of an illumination over the whole route between the station and their hotels. The following day was devoted to the visit to the exhibition grounds and a banquet at Belmont, with the usual speech making, and the guests left fully convinced of the magnitude of the preparations for the Centennial, the certainty of its success, and—it is to be hoped—a more generally *national* feeling in regard to it, rather than the narrow idea which has unfortunately prevailed to too great an extent, that it is to be a *Philadelphia* enterprise and not national in all its aspects. The speeches were above the average, practical, as is generally the case from business men, enthusiastic from a Centennial point of view, and not too long. That the result will be an awakening of the people of the West to the importance of being represented at the exhibition, and of freely extending material aid to the enterprise, cannot be doubted. Indeed, the first fruits are seen in the comments of the Baltimore papers, from which city a large delegation was present, on the reception and the condition of the buildings. The following, from the Baltimore *American* editorial correspondence, gives an evidence of this:

"Whatever the impression desired to be made by the merchants of Philadelphia in drawing together the representative men of these several States, it was more than fulfilled. Even those of us who had been present at the great Exposition of Vienna were astonished at the magnificence of the buildings and the immense area of the ground covered, and in preparation for the great Centennial." The *Sun*, in its description of the affair, says of the Centennial enterprise: "Under all the surrounding difficulties that have beset the enterprise, the business men of Philadelphia have shown a degree of pluck that even their neighbors of New York cannot fail to admire and aid to success. Indeed, there are signs everywhere that the people of the whole country now regard the Centennial Exposition as their affair, and will come in countless thousands to insure its national as well as international characteristics."

So much for the visiting guests, and now for the affair itself. It is idle, if not useless, to attempt to give an idea of the immensity of the buildings, the grandeur of their appearance, or their actualities by the use of dimensions. Figures convey to the average mind no evidence of fact, and are rarely read at all. To tell a Wall street man, or the occupant of a bank parlor, in a metropolitan city, that a building covers *forty acres* under single roof, is to give him a vague idea that it is simply bigger than another building somewhere else. To say that the Centennial buildings are nearly completed, to the man who was at Vienna, is to be answered with a strong, if polite, disbelief, and the addition of "Oh, yes!" A wilderness of dirt, empty boxes, and a mountain of material. To visit the buildings alone will convey anything like an adequate idea, and no better plan can be adopted by exhibitors, merchants or manufacturers, who may have to visit your city on business, than to take a look for themselves. Machinery Hall, in which the greater mass of your readers will be exhibitors, *is* finished, and is now seen in its grandeur, much better than it will be when occupied by machinery—as a building. Standing in the eastern doorway, one can *just see* the form of a person in the western doorway, without being able to distinguish the features or even color of clothing worn. This may give some idea of size. The main exhibition building view, from end to end, is obstructed by staging, etc., it being built from either end, and completed in the center. It is over one-third of a mile long and one-eleventh of a mile wide of unbroken floor space, and covers forty acres. Take these distances on Broadway, and across from the North River, and "even a New Yorker" may figure to himself this *big thing* in iron buildings. Horticultural Hall, one of the most elegant buildings, is receiving the completing touches to the conservatories, and will present a magnificent area of bloom and verdure under glass. Agricultural Hall is yet too inchoate to describe, but it is rapidly advancing. Memorial Hall, to be the Art Gallery of the Exhibition, and the future Museum of Industrial Art after it is over, is probably the most perfectly proportioned building in the United States, and yet it is somewhat dwarfed by the immensity of the neighboring structures. The approaches and entrance are gems of architecture. The statues of heroic size, cast in iron and galvanized, which are to adorn the towers and wings, have arrived and are on platform cars awaiting erection. The size may be guessed at from the fact that the figures extend the entire length of a platform car each. Commerce, mining, manufactures, agriculture and art are here typified on a truly heroic scale, but in perfect harmony of proportion. But enough of the Centennial Building. It is to the readers of *The Iron Age*, who represent every branch of the industry, we would speak. The reports indicate that fewer exhibitors appear, as yet, among the iron manufacturers than almost any other trade. Unless others yet appear the iron ores of the country will be almost unrepresented—only one each from Lake Superior and Missouri are reported as yet. This is not creditable. Foreign nations will send us everything of their best. In many articles both native to our country and of our manufacture we can *beat this best*—whether we do it or not will materially affect our future trade, and in a purely monitary point of view it will be profitable. Nor is the matter of aid to the cause by subscription to be forgotten. Dropping patriotism and national pride it is distinctly stated that the very best reasons exist for believing that every share subscribed for will be refunded in full with profit—in short, to use the trite quotation, "there's millions in it," truly.

Sir Chas. Wheatstone, F. R. S.

A dispatch received from Paris, having date of the 21st inst., announces the death of this distinguished scientist, which occurred there yesterday. Prof. Wheatstone was born in Gloucester, England, in 1802, and in early youth was engaged in the manufacture of musical instruments. This occupation led him to study the laws of sound and their application to music, and from this he proceeded to investigate the laws of light experimentally. He published in the *Journal of the Royal Institution* and the *Philosophical Magazine* many experiments in optics and acoustics, made in his researches. In 1833, through Prof. Faraday, he communicated to the Royal Society a paper on "Acoustic Figures," and the following year he sent his memorable "Account of Some Experiments to Measure the Velocity of Electricity and the Duration of Electric Light." The same year he was appointed Professor of Experimental Philosophy in King's College, London, and was elected a Fellow of the Royal Society in 1836. In June, 1838, he communicated to the Royal Society a paper entitled "Contributions to the Physiology of Vision," describing in it and giving the name to the stereoscope, now so familiar to everybody. His experiments with electricity brought him to see in a measure the great revolution since effected in the transmission of intelligence, and in connection with Mr. William Fothergill Cooke he attained such results as entitled him to be regarded as one of the inventors of the electric telegraph. Though Prof. Morse's invention was undoubtedly of earlier date, it is not known that Prof. Wheatstone had any knowledge of Prof. Morse's discovery when he in June, 1836, made public his own experiments. He was associated with Mr. Cooke in the first telegraph patent in England. An official paper by the late Sir M. I. Brunel and Prof Daniell, at a time when some misunderstanding had arisen from the conflicting claims to the origin of the invention in England, presents his connection with the invention in the following language: "In March, 1836, Mr. Cooke, while engaged at Heidelberg in scientific pursuits, witnessed for the first time one of those well known experiments on electricity, considered as a possible means of communicating intelligence, which have been tried and exhibited, from time to time, during many years by various philosophers. Struck with the vast importance of an instantaneous mode of communicating intelligence (especially by the medium of railways), and impressed with a strong conviction that so great an object might be attained by means of electricity, he immediately directed his attention to the adaptation of electricity to a practical system of telegraphing, and giving up the profession in which he was engaged he from that hour devoted himself exclusively to the realization of that object. He returned to England in April, 1836, to perfect his plans. In February, 1836, while engaged in completing a set of instruments for an intended experimental application of his telegraph to a tunnel on the Liverpool and Manchester Railroad, he was introduced by Dr. Roget to Prof. Wheatstone, who for several years had given much attention to the subject of transmitting intelligence by electricity, and had made several discoveries of the highest importance connected with this subject. Among these were his well known determination of the velocity of electricity when passing through a metal wire; his experiments, in which the deflection of magnetic needles, the decomposition of water, and other voltaic and magneto-electric effects were produced through greater lengths of wire than had ever before been experimented upon, and his original method of converting a few wires into a considerable number of circuits, so that they might transmit the greatest number of signals which can be given by a given number of wires by the deflection of magnetic needles. In May, 1837, Messrs. Cooke & Wheatstone took out a joint English patent, on a footing of equality, for their existing inventions, and the undertaking rapidly progressed until it attained the character of a simple and practical system, worked out scientifically on the sure basis of actual experience. While Mr. Cooke is entitled to stand alone as the gentleman to whom this country is indebted for having practically introduced and carried out the electric telegraph as a useful undertaking, and Prof. Wheatstone is acknowledged as the scientific man whose profound and successful researches have already prepared the public to receive it as a project capable of practical application, it is to the united labors of two gentlemen so well qualified for mutual assistance that we must attribute the rapid progress which this important invention has made during the five years since they have been associated." This paper appeared in April, 1841. The electro-magnetic alarm was also invented by him, as well as several instruments for registering, by means of electro magnetism, the indications of the thermometer and barometer, the transient observations in astronomy and extremely short intervals of time. He had twice received the Royal Society's medals for discoveries. In 1855 he received from the Emperor Napoleon III. the decoration of Chevalier of the Legion of Honor, for his "application of the electric telegraph." In 1838 he published a volume of experimental researches. In 1868 the Queen conferred on him the honor of knighthood. He received the degree of LL. D. from the University of Edinburgh, April 12, 1869. Prof. Wheatstone's health had been failing for some time.

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We would also call attention to the *fact*, that in 1869 we made several *important* improvements (secured by patents), on the old wrench previously manufactured by L. & A. G. Coes which were *at once closely* imitated and sold as the *Genuine* Wrench by certain parties who seem to rely upon *our* improvements to keep up their reputation as manufacturers, and although the fact of their imitating our goods may be *good* evidence that we manufacture a superior Wrench, we wish the trade *may not be deceived* on the question of *originality*. Trusting the trade will fully appreciate our *recent* efforts, both in improvements on the Wrench and in the adoption of a Trade Mark, we would caution them against imitations. None genuine unless stamped

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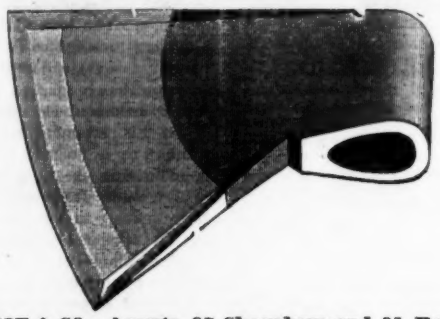

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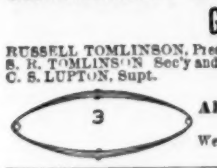

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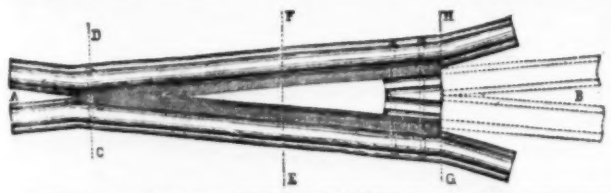

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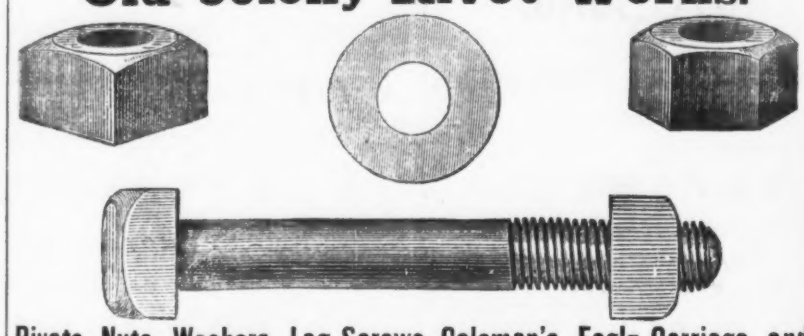

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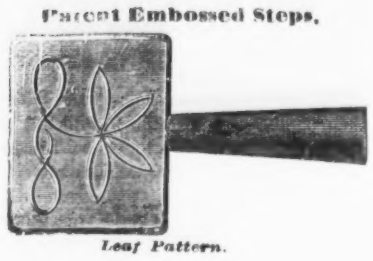
Patent Embossed Steps.

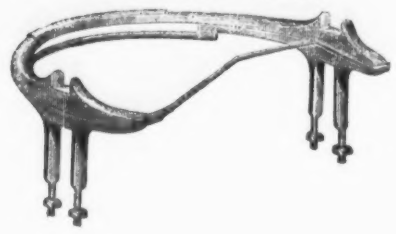


Leaf Pattern.

King Bolt Yokes

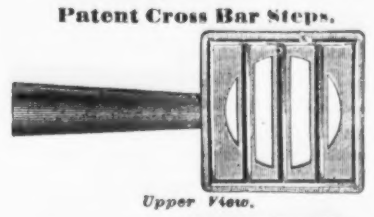
Established 1850.

No. 6 Fifth Wheels.



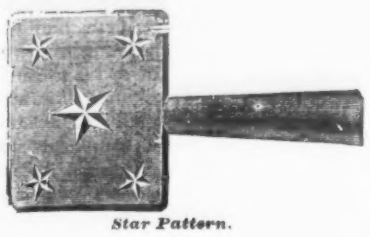
1871 Pattern Shaft Couplings.

Patent Cross Bar Steps.



Upper View.

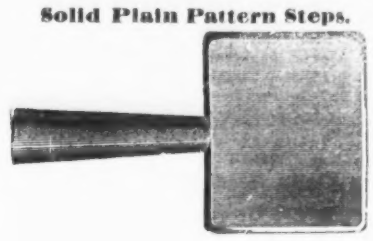
Lower View.



Star Pattern.

Smith's Improved Philadelphia Pattern Slat Irons.

Solid Plain Pattern Steps.



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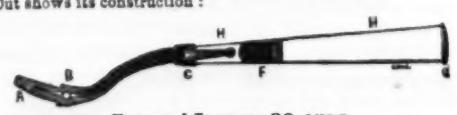

Patented January 26, 1875.

A B, Malleable Iron Tang, (not liable to break.) C, Brass Ferrule, (giving handle neat finish.) H H, shows the two sections of the Round Bright Tin Handle, as filled with Plaster Paris and Cork. The first section sets the Tang, (and firmly holds it;) then the *Cork* F is introduced, and balance of Handle filled with Plaster Paris, and capped at G.

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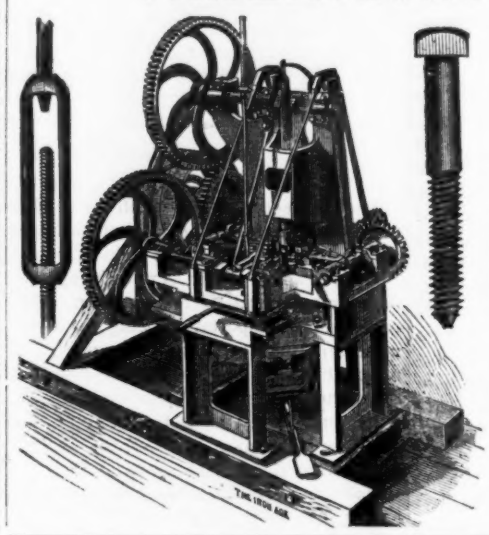

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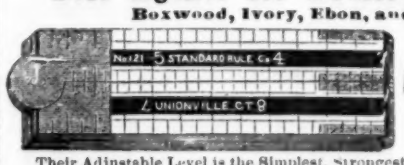

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New York, Thursday, October 28, 1875.

DAVID WILLIAMS - *Publisher and Proprietor.*
JAMES C. BAYLES - *Editor.*
JOHN S. KING - - *Business Manager.*

NEW YORK, January 2, 1875.

Until the 1st instant the postage on newspapers was paid by subscribers at the office where the paper was received, the yearly rates on the different editions of *The Iron Age* being as follows: Weekly, 40 cents; Semi-Monthly, 40 cents; Monthly, 24 cents.

Under the provisions of the new postal law, which went into effect on the 1st instant, prepayment at the office of mailing is required, at the rate of two cents per pound for the Weekly, and three cents per pound for the Semi-Monthly and Monthly, which will make the postage as follows on the different editions: Weekly, 50 cents; Semi-Monthly, 30 cents; Monthly, 15 cents.

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City Subscribers will confer a favor upon the Publisher, by reporting at this office any delinquency on the part of carriers in delivering *The Iron Age:* also, the loss of any papers for which the carriers are responsible. Our carriers are instructed to deliver papers only to persons authorized to receive them, and not to throw them in hall ways or upon stairs; and it is our desire and intention to enforce this rule in every instance.

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Labor and Wages.

The charge of Judge Orvis to the jury impanneled to try Sincy and Parks, the leaders in the late riots and disturbances in the anthracite mining districts of Pennsylvania, contains many wise and practical comments on questions of interest to both workingmen and employers. We regret that our space does not permit us to quote liberally from this charge, but we make room for one passage which defines the relations of labor and capital so clearly that it should be read and considered by workingmen in all trades. We quote as follows:

Nothing can probably control the price of labor but the law of supply and demand. If work is plenty and laborers scarce they can increase their wages by demanding it, because the employer has no option. If work is scarce and laborers plenty, competition will bring down the price of labor as it will of everything else. No class of men has the right to monopolize any particular kind of labor. Each individual has the right to engage in any kind of work that suits him, and to sell his labor for any price he can obtain for it, and a combination or organization designed to interfere with this right is against public policy and unlawful. All persons who labor for others do so upon the terms of a contract, either expressed or implied. If an agreement is made in advance as to the wages, it is an express contract; if no such agreement is made, the law implies a contract on the part of the employer to pay whatever the labor is reasonably worth, or what others are receiving for similar work. Neither the employer or employe can compel the other to pay or receive more or less than he is willing to contract for. The law gives the employer no right to impose upon the laborer, for if he is dissatisfied with his wages or his treatment he may go elsewhere or seek other employment. The whole country is open and free to him, but he must not prevent or hinder others from working who are willing to do so.

There is nothing new or original in this definition of the rights of labor, but it has the merits of simplicity and brevity, and at the same time it covers the whole ground. It is of the utmost importance to an intelligent understanding of the relations of labor to capital that the workingman should appreciate the fact that society is not divided into two great antagonistic classes—capitalists and laborers. Every man who knows a trade or is able to work is as truly a capitalist as the man who owns a factory filled with costly machinery. His capital is his physical strength and his acquired skill in the performance of some useful labor. When he gains possession of a shovel or a kit of tools, he has become—in a small way, of course—a capitalist who owns machinery, and is able to direct and operate that machinery in useful production. Like the larger capitalists, the workingman offers to exchange services of one kind for those of another. He may demand what he likes in exchange for his services, but his demand does not determine their value. The large capitalists is at liberty to charge a dollar for the service he renders in converting a pound of pig iron into merchant bar, and he may refuse, if he chooses, to render this service for a less equivalent than one dollar per pound of the finished product. But obviously no one would pay this amount for this service, so long as there are others who will render the same service for a less compensation. Were there but one puddling furnace and one roll train, and no other means of making wrought iron, the owner of so valuable a plant might ask a dollar a pound for the service of converting pig iron into merchant bar, and would undoubtedly get it. The same rule applies to the small capitalist, who calls himself a workingman. We will suppose that he is skilled as a puddler or roller, and has the physical strength to work his trade. If no other man could be had to work the single puddling furnace or roll train, he could demand half a dollar a pound, and perhaps more, for every pound of merchant bar he might make. We know a mechanic who works every day at a bench, and who has no partnership interest in his employers' business, who receives wages to the amount of fifteen thousand dollars a year, and is in no danger of losing his place. Practically, he is in the position of the supposed puddler or roller, who alone understands the business of converting cast iron into wrought iron. He is skilled in a branch of mechanical work which no other man in the country can perform so well as he, consequently his services are in such demand, and the competition among employers to obtain them is so active, that he commands the amount named. Let us suppose, however, that he were one of five hundred men in the same trade who can do this work indifferently well. Of such men there are more than are needed, consequently they are continually competing for employment, and are willing to sell their services cheap. From five to six hundred dollars a year is the average value of services in the trade in which the one man we have mentioned earns fifteen thousand dollars. Any one of the others who can do the same kind of work less skillfully, might value his services at fifteen thousand dollars a year, but obviously he could not command this price, for others as skillful as he are ready and anxious to sell their services for six hundred dollars a year. Now, it is evident, if we consider closely, that the one mechanic who earns these high wages, does not command it merely because he is skillful. A man might possess a monopoly of the skill in carving concentric ivory balls, after the manner of the Chinese artisans, and not be able to make a living in this country. No one wants his services, and a supply of anything for which there is no demand is valueless. An average blacksmith could sell his skill for more than the carver of ivory balls could command, because there is a demand for blacksmiths, and the number competing for employment is not so great as to depress the value of a blacksmith's services below the amount on which a man can comfortably support himself and his family. Thus we see that the price of labor is determined by the same natural law which determines the value of all other commodities. When buyers are competing the seller has the advantage; when sellers are competing the advantage is with the buyer.

If these simple elementary truths could be impressed upon the minds of the workingmen, they would at once see the folly and futility of all efforts to artificially increase the value of their services. What demagogues and trade union organizations delight to call "the war of labor upon capital" is no new crusade. It began, if we remember rightly, in the fifteenth century, and has continued with more or less bitterness ever since. During this time the condition of the working classes has greatly improved, and the improvement is still going on; but it is an improvement which has taken place in spite of, and not because of, the lack of a harmony of purpose and action between employers and employed. The natural laws of trade are as immutable in their operations to-day as they were four centuries ago, and all human power cannot set them aside or suspend their operation. Labor is, and always will be, merchandise. Those who have it to sell can only get for it so much as those who are asked to buy it are willing to give. Self interest, which is equally strong on both sides, operates to protect the seller against injustice and the buyer against extortion; while the public interest demands that the exchange of services should be free. Intimidation, threats, or violence to person or property, which have for their object a disturbance of the natural relations existing between labor and capital, are crimes against society, and when they go unpunished the rule of law gives place to anarchy.

Centennial Transportation Facilities.

The character of the facilities in preparation for handling articles and packages shipped to the Centennial Exhibition are such as to admit of the service being rendered in a very satisfactory manner. This problem of transportation being one of the most important relating to the success of an exhibition, it is gratifying to find that the matter has been well provided for. Mr. Adolphus Torrey is at the head of the Bureau of Transportation for the Centennial International Exhibition. The national system of interchange of cars enables goods from all points in the United States or the Canadas to be shipped directly to Philadelphia, without breaking bulk, and water communication opens the exhibition to all parts of the world. The service upon the grounds will include the delivery of the goods or packages in the space where they are to be unpacked and displayed; the removal and storage during the Exhibition of the empty packing cases, and finally, when they are refilled with the articles exhibited, removing them from the Exhibition for reshipment.

As the greater part of the goods arrive in a space of a very few days just previous to the opening, arrangements have been made to dispose of a great bulk of freight in an exceedingly short time. Separate railroad stations are provided to the number of eleven, each station answering for that portion of the grounds and buildings in its neighborhood. These stations consist of covered platforms 160 feet long by 24 wide, at which 5 cars at a time can unload, and side tracks at each station accommodate 5 cars more. Four of these platforms will immediately adjoin the main Exhibition Building. Three are for the use of the Machinery Hall, but the tracks will also traverse the whole length of this structure in several aisles, for the unloading of heavy articles. Of the remaining stations, one will be near the United States government buildings, one will be for the use of the Agricultural Building, and one will be at another point near the lake.

The floor space of the larger buildings is divided into rectangular compartments, lettered and numbered, somewhat after the plan of the Philadelphia streets, a plan which makes it easy for the exhibitor to find his proper location. Large sheds will be provided for the storage of the packing cases, which will be registered and numbered to correspond with the location of the exhibit to which they belong, a plan by which they will readily be reclaimed.

On the occasion of the recent "Railway Jubilee," commemorating the semi-centennial anniversary of the opening of the Stockton & Darlington Railway, two rails of unusual length were rolled at the Britannia Iron Works, Middlesborough. One was 108 feet and the other 112 feet long. They were of the ordinary T shape, weighing 40 lbs. to the yard. The 62 foot rail lately rolled at the Edgar Thompson Steel Works was the largest we remember hearing of as having been rolled in an American mill.

The Metric System.

From time to time the subject of introducing the metric system into this country is brought up and canvassed, the newspapers upon the periodical appearance of the theme taking it up and publishing uncounted columns in praise of its advantages. One not familiar with the facts would naturally conclude from all this talk that, in the metric system of weights and measures, a cure is to be found for all our mathematical troubles. Indeed, it seems to be very generally supposed that calculation will become a mere pastime when the new system is adopted, and we are no longer troubled with the tables of weights and measures—the bugbears of so many school rooms. But notwithstanding the unqualified commendation it has received, the progress made by the system is by no means rapid, nor gratifying to its advocates. While its use has been authorized by Congress, and the scientific men of the country are employing it to some extent in their calculation, there is more or less aversion among the practical men to the adoption of any such system—an aversion, however, which makes itself more felt by passive resistance than by any direct, active opposition. Thus, in past time, among certain scale makers, there was always a decided dislike to the French system. They "hated anything decimal," not from trade dislike, but because there were extra annoyances connected with it that were by no means to be disregarded. What these are we will briefly consider.

The metric system of weights and measures is of French origin, and was first suggested in 1528. It took practical shape about 1790. It is a decimal system, in which the units of length, surfaces, solidity and weight are correlated, two data only being used, the metre and the weight of a cube of water the side of which is one hundredth part of a metre. In theory this is exceedingly simple, and when we learn that the metre is to bear a certain definite proportion to the quarter part of the meridian of Paris, it seems to have a certain relationship to a standard which is always accessible, and from which, should the metre be lost, the recovery would be easy, since the metre was to be one ten millioneth part of the quadrant of the meridian of Paris. Unfortunately, the measurements were not of sufficient accuracy to be of any value, and it would be impossible to recover the measure from the arc of the meridian, hence the standard is, to speak accurately, an arbitrary one, in spite of the assertions in regard to it. While the decimal system of weights and measures presents certain advantages in the matter of calculation, it is by no means certain that general calculations are as easy as they would be with other properly devised systems. The defects of the decimal system of notation are by no means small, and its real advantage, or the one which has probably given it such a wide acceptance, is the device of place. The base of the system is regarded by many as a very unfortunate number, and could science be applied to give us a new system of notation, the result would be a really desirable improvement. While the decimal system affords great facilities for complex calculations, it is by no means the most convenient for the calculations of the store and the workshop. As a rule, each trade has a system of measures or weights best adapted to its wants, and contrived so that its calculations can be made with the minimum labor. The difficulty in the olden time was that there were no really accurate standards for the comparison of these different systems of weights and measures, and thus endless confusion resulted. Science stepped in and attempted to settle the difficulty by giving a decimal system as a substitute for all the confusion. In some respects the substitution was a good one. Unfortunately, however, the decimal system is not the best one that could be desired for an arithmetical notation, and hence in its application to weights and measures there are the same objections to it that are found in using it for calculating. It is to be noted that it is a system of special value to the man of science, and may be said to be contrived for his convenience. Yet the number of persons who employ it in a way to appreciate its advantages may be told by the hundred, while there are hundreds of thousands who use it in the small way and see only its troubles and annoyances. One of the things urged against our ordinary system of weights and measures is their complexity and the difficulty of performing operations with them. This complexity is really a matter easily set right by an exercise of the memory or a reference to the tables themselves, and not a matter requiring thought. It is claimed, however, that the use of the decimal system will abolish all this trouble, and that the time lost in memorizing the tables will be saved. In a considerable experience in schools and teaching we have uniformly found that there were as many, if not more, mistakes made in decimal fractions and the like than in the so called exercises in reduction, and in decimals there was nothing to which reference could be made to check errors. Errors in the use of the decimal point are exceedingly common among all classes of persons after leaving school, and usually these errors are of a nature to escape detection by the persons themselves. Every one is supposed to be able to multiply and divide, but the theory of decimal fractions is generally a matter passed lightly over in school education.

Decimal notation has not been successfully applied to time, to the division of the circle, nor to the arrangement of music. A lecturer in this city, not a great while ago, gave a very amusing description of the attempt made by an orchestra to play a piece of music with ten half notes to the measure. The failure was, of course, complete. In the workshop the use of the metric system is not convenient, for, while the measure does not readily come into a size convenient for the pocket, the divisions are either too large or too small to make measurements of the most convenient character. Practically, a variety of tables are needed. For example, the metal worker has two systems of measurements known as the Birmingham and American wire gauge. This has been the outgrowth of necessity, and if the decimal system be adopted we shall, doubtless, have various other systems of measurement used for convenience in various arts and trades. In the store and workshop the half, quarter, third, eighth and sixteenth are constantly recurring fractions, and in these the decimal system of weights and measures is confessedly weak, a large part of the most commonly used fractions being represented by reapeating decimals, and others by a considerable number of figures. It is probably on account of the many disadvantages of this kind that the decimal system has been so slow in obtaining a foothold. On the other hand, the old tables of weights and measures are the results of long usage which carefully selected the most convenient forms and those which reduced the labors of calculation to a minimum.

We think, in spite of the very perfect form which the system has, that the science can give us one both better and more convenient, and certainly one in which the nomenclature shall be less likely occasion error. It is to-day a very difficult matter to insure correctness, for when one writes gram, which is the usual abreviation of gramme, it is very commonly printed grain, and *vice versa*. The tables of the United States money is a model in this respect, and is far in advance of the French system in a practical way, yet in spite of this fact currency prices and calculations are daily made in shillings, which shows that the decimal system is not perfect, since the other method of computation, on account of greater convenience, is frequently used by a large class of small tradesmen.

Tin and Tin Plates.

The statistical position of tin is interesting. During the nine months ended with September, there were shipped from the Straits and Australia, 12,542 tons of block tin, against 7698 tons for the same time last year. The deliveries from London this year were 10,070 tons, against 5276 tons last year. The general position of the metal on the 1st of October was as follows:

STOCK OF TIN IN EUROPE.

	Oct. 1. 1875. Tons.	Oct. 1. 1874. Tons.	Oct. 1. 1873. Tons.
Banca on warrants	235	877	1,385
" Trading Company	2,992	3,982	4,120
Billiton	919	1,010	860
Straits and Australian at London	5,595	2,658	1,977
	9,744	8,527	8,342

AMOUNT OF TIN AFLOAT FOR EUROPE.

	Oct. 1, 1875. Tons.	Oct. 1, 1874. Tons.	Oct. 1, 1873. Tons.
Banca	622	188	190
Billiton	1,000	250	250
Straits	1,140	920	150
Australian	1,369	1,000	150
	4,031	2,308	590

From this it appears that the general position of the metal was less favorable on the 1st instant than at the same date last year.

The excitement which attended the late rapid advance has been followed by a season of calmer reflection and more careful operation, both in this country and in Holland. Mail advices from Australia up to the beginning of August report a curtailed production at the mines, and the opinion is expressed that there will be a decrease in the shipments to England, whereas it appears that expectations of larger shipments from that country to the United States, as well as to China, are likely to be realized. During the first eight months of the current year the shipments of Straits tin to the United States were 36,321 piculs, against 26,355 last year—an increase of 9966 piculs, equal to 596 tons.

The position of the market for tin plates has been extremely unsatisfactory for hold-

ers. A comparison of prices at the dates given below will be of interest :

NEW YORK PRICES, GOLD—ORDINARY BRANDS.

	Oct. 28, 1875.	July 1, 1875.	July 1, 1874.
Charcoal Bright...	$7·37½ @ 7 50	$8·25 @ 8·50	$10·25 @ 10·50
Charcoal Terne....	7·00 @ 7·25	7·50 @ 7·75	9·00 @ 9·50
Coke Tin..	6·37½ @ 6·62½	6·75 @ 7·00	8·00 @ 8·25
Coke Terne	6·25 @ ..	6·75 @ 7·00	7·00 @ 7·75

The recent advance in hematite pig iron and block tin in England adds one shilling per box to the cost of tin plates over there, but they had not improved that much. At the present market value in England and here we are still 50c., gold, per box below the cost of importation. Yet our dealers do not complain of a lack of demand ; on the contrary, tin plates have of late sold in excess of last year at this season. What they complain of is the low price which the article is bringing, and as they hold the stock, it is difficult to explain why they do not agree upon an enhanced selling price, since what they sell cannot be replaced at the same figure. A comparison between present rates and those ruling on July 1, as per table above, shows that we have since then declined 8 per cent. Yet for Straits tin, inactive as it is, this market now commands 19¾c., gold, against 18¾c., gold, there, an improvement of a little over 5 per cent. Admitting that the advance in tin may have been legitimate, tin plates certainly appear unduly depressed.

New Publications.

LABOR IN EUROPE AND AMERICA, by Edward Young, Ph. D., Chief of the United States Bureau of Statistcs. Government Printing Office. 864 p.

This is a work of vast labor and research, containing an immense mass of information and statistics of the rates of wages, cost of subsistence and the condition of the working classes in Great Britain, Germany, France, Belgium and other countries of Europe, and also in the United States and British America. The material contained in this work was mostly gathered during a tour through Europe by the author, who was afforded every possible facility in obtaining the necessary information. The methods employed for obtaining the figures the author has explained to us, and also the various processes by which the results were obtained. It is sufficient to say that, while we are unable to give an explanation of them here, we are perfectly convinced of their soundness in principle, as well as of the accuracy of the resulting conclusions. While the work presents an accurate view of the present condition of labor in Europe and America at the present time, the author has given a most exhaustive and exact historical account of labor from the earliest times to the present, a very large proportion of which is from original sources. Laws, trade unions, co-operative associations and numberless other matters pertinent to the subject are taken up, and, in addition to useful, valuable and new information, we have an array of figures as satisfying to the practical man as they are gratifying to the student. The minuteness of detail in all parts of the work is surprising, and this detail of figures is supplemented by letter press which makes the tables not only useful but interesting.

We cannot give a better idea of the thoroughness of the work than by mentioning some of the facts to be found under a single head. Opening at random to Scotland, we find first tables of wages embracing all the men employed in engineering works. These follow like tables of all classes of workpeople in the jute and linen factories. Ordinary mechanical operations, farm labor, and all classes of mechanical labor in another portion of the country, form the subject matter of the concluding tables, which represent almost every occupation in the country. Prices of clothing, of provisions, of dry goods, and the expenditure of workmens' families are the subjects of other sections and tables, so that a person is able to obtain a most accurate knowledge of the condition of labor in any given country, as well as all the circumstances by which it is surrounded. In addition to statistical information, there is a vast fund of general information in the shape of reports, letters and observations made by the author, and facts furnished him by different large manufacturing firms. Information concerning the condition of the working classes in Great Britain, Germany, France and Belgium is especially full, and largely compiled from information gathered by the author on the ground, and, whenever possible, verified by careful inquiry among the artisans and mechanics. Other countries are treated as fully as the available information concerning them would warrant.

The portion of the work devoted to the United States is rich in information of the most exact and comprehensive character, but it would be impossible in the brief limits of a hastily written review, to summarize its showing. The reader will notice that Dr. Young has aimed to present facts, and these only. Nowhere do we find any more detailed expression of opinion than is necessary to a clear explanation of the statistical information presented. Protectionists and free traders can both turn to the work with confidence, knowing that whatever the showing of the figures given, the aim of the author has been to set forth simply the truth. We congratulate Dr. Young on the success of this great work, which, we are sorry to say, he considers his last.

A GRAPHIC METHOD FOR SOLVING CERTAIN ALGEBRAIC EQUATIONS, by Prof. George L. Vose.
WATER AND WATER SUPPLY, by Prof. W. H. Corfield, M. A., of the University College, London. D. Van Nostrand, 23 Warren st., N. Y.

These two volumns form Nos. 16 and 17 of Van Nostrand's science series. The first presents diagrams by which a considerable number of algebraic equations may be solved directly. To some the methods will be both new and interesting. The second work deals largely with problems of water supply long since solved by mechanical engineers. The practical part relates almost entirely to English methods, and has little of either interest or value in this country.

ANNUAL REPORT OF THE BOARD OF REGENTS OF THE SMITHSONIAN INSTITUTION FOR THE YEAR 1874. Government Printing Office.

Beside the usual reports of the secretary and various committees, we have a good number of interesting papers upon various scientific subjects. Laplace-Laplace, Quetelet and De La Rive open the collection. Among the more important papers are the following: "On Tides and Tidal Action," by Prof. G. E. Heilgard ; "Warming and Ventilation," by Gen. Morin, and one on "A Dominant Language for Science," by Alphonse de Candolle of Geneva, Switzerland. There are many others of interest which we have not space to notice here.

Practical Observations Upon the Puddling Process.

BY J. M. BURTON.

(Concluded).

In treating of the actual working in the furnace, it seems best to describe the changes as they would appear to a spectator, leaving till later the explanation of the chemical changes of each division.

For the sake of greater clearness and the convenience of reference we will divide the whole operation of the boiling process into the following heads :

1. Charging the furnace.
2. Melting the metal.
3. Cooling the bath and preparing the proper slag.
4. Action of the slag or boiling the iron.
5. Turning and balling the iron.
6. Drawing the charge.

1. Before "charging the furnace," or introducing the cold metal, the furnace should be brought to as high a heat as possible, the solid door (mentioned in the description of the external appearance of the furnace) is raised by means of the lever and chain and fastened open. Then several shovels full of squeezer cinder are scattered over the hearth, and on this the pig metal, about 500 lbs., is thrown. The metal should be cast in the center for the convenience in turning the pig, and the whole operation, although the lifting is severe, should be performed quickly, lest the furnace become too cold by the door being open so long. The fire may be levelled (coal put on) before the charging is quite finished. Finally, the door is lowered, and made firm by a bar and wedge; a lump of coal is placed in the opening of the working door, and the aperture entirely closed by a small iron plate ; coal dust is placed around the bottom of both doors, to keep the air from being sucked in through the crevices.

2. Melting the metal. The furnace is now left to the care of the "helper," who must watch the flame carefully, and keep up a strong fire until he perceives the iron to be have become red-hot. This generally takes about 15 minutes, the fire having been stirred with a long rod ("poked up") several times. The plate is then taken down, the coal removed, and a crow bar inserted ; all the iron should be now "turned" so as to expose to the flame the parts previously covered. This operation should be performed rapidly, as I have seen much trouble caused by the plate being down too long, although the pig bars often require much labor and no little patience from getting jammed, before they can be properly burned. At the end of this operation the fire generally requires more coal, and from my own experience I prefer throwing it on with the shovel, rather than using the fire hook, which is more apt to cake the fuel. The metal requires to be burned once more before completely melted; after that it is covered on the top with a white crust (magnetic oxide).

At the end of half or three-quarters of an hour the plate is finally cast to one side, and the helper introduces a bar first, and breaks up the lumps of metal not completely melted. A hooked bar, called a "rabble," is then used, and the whole bath carefully tested for unmelted portions. The temperature is then lowered by shutting the damper, and putting on a good covering of coal, whilst the puddler generally takes this opportunity to clean his grate. Some iron will not, however, permit the lowering of the damper, and will only bear the cooling process which I am now about to mention under the third heading.

3. Cooling the bath and preparing the refining slag is done by casting into the liquid bath scales from the finishing rolls, which consist essentially of magnetic oxide (Fe_3O_4); this is continued until the bath has become thick and pasty, so that the tool can only pass through it with difficulty. After the use of two or three "rabbles," it begins to grow liquid, and its characteristics must then be carefully observed —if it is reddish and runs thinly, more scales must be added, but if it is thick and white, the proper slag has been obtained.

4. Soon the slag begins to work, and large bubbles rise to the surface. The damper is now raised, so as to gradually increase the heat whilst the rabble is exchanged for a similar tool, except with a much broader hook, called a "splasher." The helper must now work rapidly and thoroughly, with long scooping motions, so as to intermix the cinder, and get all the iron off the bottom, paying especial attention to the corners or "jams." If this is done properly the bubbles grow more frequent, emitting a small, blue flame, whilst the whole bath gradually rises until the slag begins to flow out of the working door into a small iron wagon called a "buggy." The impurities of the pig, consisting essentially of phosphorus, blow out with the slag in the form of small black scales, which, at the furnace door, are of considerable size, and so light that I have often seen them lifted from the surface of the slag and carried up the chimney by the draft. These must all be removed with the greatest care, and at as low a temperature as is considered safe.

The puddler now takes the tool and the "boiling" fairly begins. This, as may be inferred from the name, consists in an apparent violent boiling of the entire bath, whilst small blue flames play over the surface and follow the furrows made by the tools. The slag or cinder becomes brighter and somewhat thinner, appearing of darker color further back in the furnace. The iron—or, rather, steely iron—"comes to nature," as it is called, and floats on the surface in beautiful little lumps or crystals resembling snow. The puddler, during this period, should have plenty of the refining cinder mixed with his iron, as it is much better to tap off the excess at the end of the "heat" rather than risk bringing out an imperfectly boiled product called "raw iron."

When all the iron seems to be on the surface it is best washed in the cinder, and made homogeneous by giving a rotary motion to the tool, causing the crystals to revolve and exchange place with those below. The bath grows stiffer, and the "splashers" are exchanged for the "rabbles," whilst the bottom and sides are carefully worked over to prevent portions of the iron from sticking fast, which would be of the greatest inconvenience afterward.

The temperature during the boiling must be kept at a very high point—generally as high as the furnace is capable, though the cinder may become too thin and acid to mix well with the iron. Soon all the cinder seems to have sunk to the bottom, all ebullition ceases, and then the iron is said to have "dropped," which terminates the boiling period and brings us to the fifth division.

5. The wrought iron is now robbed of its protecting cover of cinder, and lies exposed to the full action of the flame, which by this time is generally of a hot, clear, oxidizing character, and must be changed, by the addition of coal, to a reducing flame.

The helper now takes a crowbar and "turns" the iron, by inserting to the bottom of the hearth and throwing the iron on top of the other, beginning at the center, and dividing the bath into two divisions. This is repeated some two or three times, whilst all particles attached to the bottom and sides are carefully removed. "Raw iron" is very apt to betray itself at this point, by being acted upon by the cinder lying on the bottom, showing bubbles of gas.

The puddler now takes the bar (called a paddle), and must use all his strength in the severe labor of "balling the iron." If the iron is homogeneous, and retains enough cinder, it should weld with ease and yield to the pressure of the bar; but if not, it will crumble and give great trouble.

The object of balling is to collect as quickly as possible the hottest portions and make them the nucleus of a ball as round as possible, and weighing about a hundred pounds. Two or three more are made, and rolled in the cinder which lies on the bottom. The waste caused by oxidation is very apparent whenever a ball is allowed to remain in the draft from the working door, the iron and cinder running off into the cinder below.

The fire is, therefore, carefully and quickly "levelled," or covered with a layer of fresh coal, so that no holes may give a passage for an oxidizing flame, the wedge and bar are removed, and the large tongs for the drawing out of the balls are taken down. The "buggy," which consists of a large iron ring, mounted on wheels, is placed below the furnace door, and on this ring the ball is dropped, and wheeled off to the squeezers. The character of the iron is shown most clearly by its action under the squeezers. A soft, well worked iron will yield with every motion of the iron jaw, and soon a clear cinder will flow out from all sides. The action will be similar under the puddle rolls giving at the end a long flexible bar free from cracks. A raw iron will yield less readily, and soon show more or less large gaps and cracks, from which proceeds long blue flames. A raw iron will sometimes retain sufficient cinder to apparently heal these wounds, but there is generally much waste from the iron crumbling off and breaking as well under the rolls as under the squeezers. Cold iron will act very much like raw iron, though not necessarily accompanied by the blue flame, and the helper must watch the blooms (or balls), and keep them hot by raising the damper or poking up the fire.

When the charge is all drawn the cinder in the bottom is thickened, generally by the addition of squeezer cinder, the sides smoothed by splashing it against them and the hearth carefully cleaned for the next "heat." More cinders are scattered over the bottom, the pig iron thrown in and the "melting down" once more begun.

THE CHEMICAL PHENOMENA OF THE PUDDLING PROCESS.

As I have previously intimated, I will take each of the divisions into which I have divided the whole process, and endeavor to portray as clearly and concisely as possible the chemical changes that take place.

THE MELTING OF THE METAL.

Under this head we will first speak of the cinder left from the previous charge which was splashed up against the sides, and the squeezer cinder thrown in. The two cinders may be considered as bearing a strong similarity to each other in constitution, if the puddler secures them from his own balls. Squeezer cinder shows the following composition upon analysis :

	Calvert & Johnson.	Kollman.
Silica	16·53	15·32
Iron (FeO)	66·23	52·18
	....	Fe_2O_3 22·31
Sulphide of Iron	6·80	
Phosphoric acid	3·80	2·30

These may be considered as highly basic silicates containing much of the impurities of the pig metal, and therefore, when fused, forms an impure "refining slag." The object of this addition to the "charge" may easily be inferred, viz., to act on the fused metal that lies on the bottom, and thereby form a more homogenous decarborization. In puddling iron, for the manufacture of rails, this addition of a refining slag is omitted, causing the iron to lie heavily on the bottom during the process, giving a product rich in carbon. If the clear cinder flowing out during the boiling could be conveniently collected, or the cinder from heating furnaces used, they would both undoubtedly be much purer, and of the same essential character ($Fe_2SiO_4 + Fe_3O_4$), but I have never seen the experiment practically tested.

Another point, of undoubted influence upon the iron, is the fact that the greater part of the cinder splashed against the sides fuses down again into the bath, the worst feature being that it probably occurs during the high temperature of the boiling period, when the phosphorous cannot be removed, except imperfectly, under the squeezers. These remarks are also applicable to the impurities contained in the ore used in "fixing" the furnace. The Missouri ore has an advantage almost equal to its purity, in the fact of its great solidity, and as a hematite (Fe_2O_3) will sustain a strong heat for a long time without being renewed; for every piece of cold ore placed in the furnace absorbs a certain amount of heat, which should have been given to the metal, causing the furnace to "work cold," and producing waste, and a tendency toward a "raw iron."

We are now brought to the consideration of the action of the pig metal as it approaches the state of fusion. The first reaction is undoubtedly that of a strong oxidation of the surfaces, when brought to a red heat, increasing with the temperature. This is shown in the formation of a white crust (magnetic oxide), which is composed of three distinct divisions. Percy gives a number of analyses performed by Smith in his laboratory, which, expressed in formulæ, are as follows: The outer layer is represented as Fe_2O_3; the middle one by $3Fe_2O_3 + 10FeO$ or $3Fe_3O_4 + 7FeO$; the inner by $Fe_3O_4 + 5FeO$. point of highest oxidation is in the middle.

I have previously mentioned that magnetic oxide is a strong oxidizing agent, and it remains true to its character, and in time would entirely remove the carbon as CO and silicon as SiO_2 without the pig metal being in a state of fusion. However, owing to the rapid melting of the metal, these reactions are comparatively unimportant in the puddle process.

REACTIONS OF THE METAL IN A STATE OF FUSION.

The silicon contained is first oxidized to silica (SiO_2), by the oxygen of the air and that contained in the magnetic oxide. The silica then unites with the proto-oxide of iron to form a bi-silicate. When all the silicon has been oxidized and united with the iron, then, and only then, a further oxidation of the iron takes place, and the all important normal silicate (Fe_2SiO_4) is formed, viz., $Fe\,SiO_3 + FeO = Fe_2SiO_4$. The bi-silicate is distinguished in its physical aspect by forming a thin liquid slag or cinder of a decidedly reddish hue ; in its chemical relations, as forming the essential constituent of the German *Rohschlacke* (raw slag), which corresponds to the English ferric and acid slag. The action of the ferric slag is to prevent all decarbonization of the metal, until the bi-silicate has been reduced to the lowest attainable point by the oxidation of the iron forming the normal silicate (Fe_2SiO_4. Although the ferric slag belongs peculiarly to this period of the process, when first in a state of fusion, yet, strange as it may at first seem, the slag first formed is essentially a refining slag adapted to remove the carbon. This is owing to the presence of the magnetic oxide, formed by oxidation of the surfaces of the metals, while there has not been sufficient silicon oxidized to silica to form the bi-silicate. As the normal silicate does certainly exist at this period, it will not be out of place to compare its action with that of the bi-silicate. The normal or mono-silicate has no action in itself on the carbon, but simply is valued as a solvent of the magnetic oxide, which is rich in oxygen.

It is, indeed, true that the ferric oxide (Fe_2O_3) is richer in oxygen than the magnetic oxide, but not so useful as an oxidizing agent, owing to the greater fusibility of the latter. Ignoring for the present the numerous other constituents, which do not essentially interfere with the action of the silicate upon the magnetic oxide, we may regard the refining slag to be composed of the normal silicate, with more or less magnetic oxide.

It is not possible, though the fact is very greatly to be regretted, to decide upon the reaction between the silicate and the oxide with sufficient accuracy to reduce it to formula. No two authors agree on this point, and the best authorities seem compelled to acknowledge the reaction as simply a solvent of the oxide by the silicate. It, therefore, seems safer not to consider any chemical union between the compounds, but simply the Fe_2SiO_4 holding the Fe_3O_4 in a state of solution, as such. However, the magnetic oxide is considered to be reduced from Fe_3O_4 to its lowest point as an oxide, and, therefore, of the constitution of Fe_2O_3. Now, supposing the dissolved Fe_3O_4 or Fe_2O_3 to be brought in contact with the carbon still held in the fused metal, we may express the reaction very simply as follows: $Fe_3O_4 + 4C = 3Fe + 4CO$ (a gas), or $Fe_2O_3 + 7C = 6Fe + 7CO$. The iron sinks into the bath to be again oxidized, whilst the 4—7 CO's escape, and are eventually burnt to CO_2 (carbonic acid). The importance of this reaction has been frequently mentioned, and the slag is properly named the "refining slag," which seems to be a translation of the German "*garschlacke*." In chemical terms it is often described in English writings as a "ferrous and basic slag."

It is still a disputed point by what means the silicon is oxidized, some claiming it to be due to the oxygen in the air, whilst others attribute it to that of the oxides in the slag. Mr. Wm. Siemens showed most conclusively, by experiments in his open hearth furnace, that the oxidation can take place without the aid of the atmosphere, but it is very doubtful if such is the case, as he claims, in the ordinary hand puddling process. His experiments on this subject have been so widely diffused in metallurgical writings that they are probably familiar to the reader, and do not need repetition here.

The reactions of the other constituents of the metal are comparatively unimportant. A small amount of sulphur may escape as sulphurous acid gas (SO_2), owing to the high temperature produced by the oxidation of the silicon. The phosphorous may be partially oxidized and transferred into the slag, but is immediately reduced, and again enters the oven as a phoshide (Fe_3P). Manganese goes into the slag and unites with the silica as a silicate of the proto oxide of manganese, forming a slag, in which the magnetic oxide is insoluble. The graphite is changed into the combined state without loss in amount, as carbon is never removed except when in the combined state.

COOLING THE BATH AND PREPARING THE REFINING SLAG.

The most important object to be obtained in this period is the oxidation of the phosphorus, and transforming it into the slag, and, at the same time, to assist the chemical reaction in the reduction of the bi-silicate to the mono-silicate with the formation of a refining slag.

The last period left us with too much silica in the slag, giving it a reddish hue, and great fluidity, also too high a temperature for the removal of the phosphorus. The damper is now lowered all the way, coal put on the fire and the puddler takes a small iron scoop (like a trowel) and throws in through the working door scales from the finishing rolls which have been well saturated with water. The scales should be thrown where the tool is working, and, as much as possible, well over the entire bath. The amount of the scales, of course, depends upon the nature of the iron, and, should the pig metal be so mixed as to form naturally a mono-silicate, more water must be used or too thick a slag will be formed. When the bath has become stiff, and the temperature greatly lowered by the cold scales added, nothing remains but to slowly work it and watch the character of the slag as it melts again and flows on the surface. If it is thick and gradually grows white it is of the proper character, which is confirmed by the bubbles of carbonic oxide which emit a small blue flame. The phosphide of iron has now taken oxygen from the slag and air, and is changed, probably (according to Percy) from Fe_3P to $2FeO, PO_5$, floating on the surface of the slag in large black scales that must be removed as quickly as possible before the temperature is much increased.

The addition of the "finishing scales" is to supply the necessary magnetic oxide, and so save the time which would be lost if the slag were left to absorb the iron and oxygen without assistance.

English authors do not seem to have any one accepted term for this period, whilst the Germans always speak of it as the "raw refining" (*rohfrischen*), which we will adopt on this occasion. The transition from the raw refining to the refining or boiling period is very gradual, and not marked by any sharp distinctive features. This period terminates the decarbonization in the puddling of steel, as the temperature is lowered and the balls hastily made up before the boiling fairly begins.

ACTION OF THE SLAG AND BOILING THE IRON.

Having already described the formation of the mono-silicate, with its action on the magnetic oxide, there remains little to be said under this heading. The heat is increased to practically its highest point, whilst the entire bath is raised by the efforts of the gas to escape, which allows the excess of the slag with its impurities to flow out of the working door. If it rises too high a bar is placed at the bottom of the door, so keeping it dammed in as it were. The flame should be kept of an oxidizing character, more on account of its greater heat than any influence of its own, which is comparatively trifling at this time.

The iron which first rises to the surface in this period is still so highly carbonized as to be fusible at the high temperatue, but soon wrought iron comes to the surface and remains, growing more completely decarbonized.

Great care should be taken to work the bath thoroughly and uniformly, otherwise a large portion of the iron will be ready for "turning" before the rest, and must then be exposed to the oxidizing influence of the flame, which is very great, when the metal is unprotected by the slag. An improper mixture of the pig metal is very apt to produce this vexatious state of affairs, almost compelling the puddler to bring out "raw iron" in order to save that waiting to be "balled."

TURNING AND BALLING THE IRON.

The greatest waste is probably during this period, and care must be taken not to allow the flame to become too hot and oxidizing, as the wrought iron is now unprotected by the slag. Equal precaution must be taken that the heat is not too low, to raise the cold, black looking iron, which has been below, to the proper welding heat when "turned" on top. A careless or indifferent workman will be very apt to turn his iron before it is ready, by not waiting until all the evolutions of gas have ceased; in other words, removing from the bath of slag, and introducing into his balls, imperfectly decarbonized iron. This iron, or steely-iron, remaining in a half fused state, and possessing a different amount of carbon, will not weld with the rest of the bloom, and betrays itself under the squeezers and rolls in the usual way of larger or smaller gaps and cracks, with long tongues of blue flame. There is undoubtedly, a continued decarbonization going on in the balls as long as they remain in the furnace, owing to the incorporated slag, and I have seen blooms which I knew contained raw iron much improved by being compelled to remain a few minutes shut up in the furnace, of course, causing some waste.

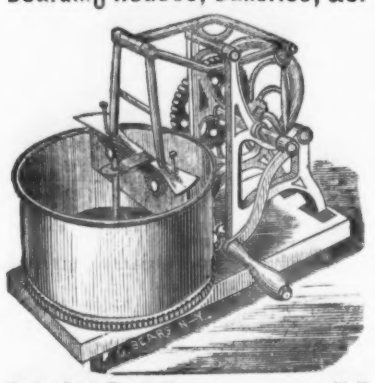
THE LABOR OF THE PUDDLER.

Puddling, undoubtedly, is a healthy occupation, as I know men who have followed it for many years, and yet show no evidence of ill health. I worked for some time with a man, who had been a puddler 40 years, and could yet do a large amount of labor, when he gave up his furnace. A certain amount of care is necessary to guard against taking cold, and self restraint when tempted to drink too much water. Owing to the good wages he receives, the puddler is able to live comfortably, and generally has good nourishing food. In closely built mills the heat is very severe, on hot summer days it often causing the men to faint; but this may be considered exceptional. A rather peculiar feature connected with the work is that mill men, especially puddlers, cannot bear any great heat of the sun, and the reverse is true, in the case of one of the men who, from a sunstroke, could not endure exposure to the sun, but suffered no inconvenience from the severest heat of the furnace. I heartily recommend "puddling" to all billious and dyspeptic people, and guarantee good circulation of the blood, and plenty of perspiration to carry off many of "the ills that flesh is heir to."

KNOXVILLE, TENN., Sept., 1875.

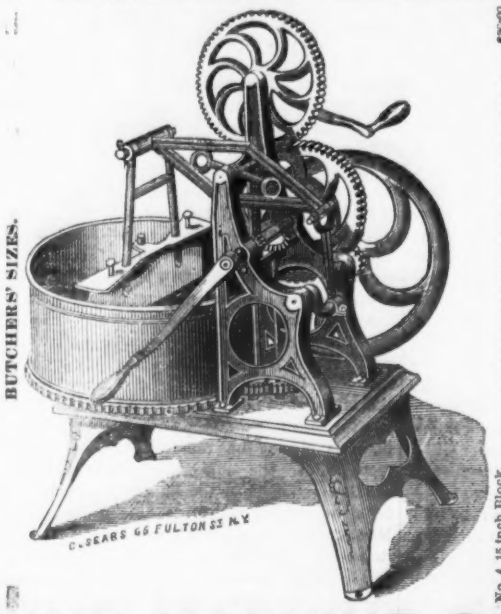
AMERICAN MEAT & VEGETABLE CHOPPER.

(FAMILY SIZES)
For the use of
Families,
Hotels,
Restaurants,
Boarding Houses, Bakeries, &c.



No. 1, Small Family Size.....$6 00
No. 2, Large " 9 00
No. 2½ Hotel or Bakers' Size..... 12 00
No. 3, Farmers Sausage Cutter..... 15 00

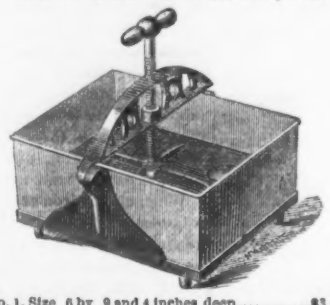
BUTCHERS' SIZES.



No. 4, 15 Inch Block..... $50 00
No. 5, 18 Inch Block..... 60 00
No. 5, 20 Inch Block..... 75 00

STARRETT'S DOMESTIC PRESS

For Pressing
Corned Beef, Boiled Mutton, Tongue, Boned Turkey,
HEAD CHEESE & OTHER MEATS.
And Extracting the Juice from
FRUITS AND BERRIES, for making DOMESTIC WINES, GRAPE and CURRANT JELLIES, &c.



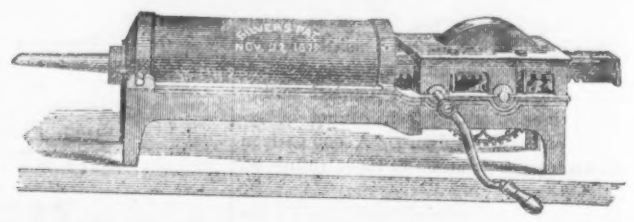
No. 1, Size 6 by 9 and 4 inches deep.....$3 00
No. 2, " 8 by 12 and 5 " 4 00
No. 3, " 10 by 14 and 6 " 5 00

Silver's Patent MEAT STUFFERS.

(FAMILY SIZES.)

No. 1, Capacity 6 lbs.....$6 00
No. 2, " 9 lbs..... 9 00

(BUTCHERS' SIZES.)



No. ½, Capacity 12 lbs.....$18 00
No. 4, " 40 lbs..... 25 00

BAILEY WRINGING MACHINE COMPANY, Agents, 106 Chambers St., N. Y.

White Lead, &c.

John T. Lewis & Bros.,

No. 231 South Front St.,
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JOHN T. LEWIS & BROS. WARRANTED PURE WHITE LEAD. PHILADA.

TRADE MARK.
MANUFACTURERS OF
PURE WHITE LEAD, RED LEAD, Litharge, Orange Mineral, Linseed Oil
AND PAINTERS' COLORS.

ATLANTIC WHITE LEAD CO. ROBERT COLGATE & WARRANTED PURE

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The Atlantic White Lead and Linseed Oil Company,
MANUFACTURERS OF
White Lead (Atlantic), Red Lead, Litharge & Linseed Oil.
ROBERT COLGATE & CO.,
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BROOKLYN WHITE LEAD CO., INCORPORATED 1835. SUPERIOR PURITY, DURABILITY AND COLOR.

ADDITIONAL TRADE MARK
We caution consumers ag'nst the numerous spurious brands, in imitat'n of ours, of adulterated and greatly inferior qualities—which are sold as our LEAD. $50 Reward for detection of counterfeits.
F. HOWE, Tr.
Office, No. 89 Malden Lane, NEW YORK.
BROOKLYN WHITE LEAD COMPANY PREMIUM LEAD WARRANTED PURE

TRADE MARK.
White Lead, Red Lead and Litharge.
89 Malden Lane, NEW YORK.
FISHER HOWE, Treas.

JOHN JEWETT & SONS,

Manufacturers of the well known Brand of
WHITE LEAD.

JEWETT & SONS' PERFECTLY PURE WHITE LEAD.

TRADE MARK.
Also Manufacturers of
LINSEED OIL
182 Front Street NEW YORK

"IRON CLAD PAINT."

TRADE MARK

We manufacture under "Green's Patents," from the purest and hardest iron ores, the best and cheapest Paint in the world for iron, iron workers, bridge builders, tin roofs, woodwork, and anything where a durable paint is needed.
Send for circular and price list.

EMPIRE IRON CLAD PAINT CO., 30 West Broadway, New York.

SOMETHING NEW!

"Zero" Stove Cover Lifter.
Patented July 27th, 1875.

Made in one piece from a superior quality of sheet iron, with a perforated cylindrical handle. Its superior advantages over any other style of cover lifter are manifest, as it will not break or bend, keeps always cool, and will fit any stove cover made. Send for Circular.

EAST RIVER SHEET METAL MFG. CO.,
SOLE MANUFACTURERS, 253 Pearl Street, New York.

STAR CHAIN WORKS,

WHITAKER & SKIRM,
Manufacturers of
CHAINS and Chute Nails,
TRENTON, N. J.

Coil Chain.
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Car Brake and Safety Chain made to any specified length.
Special attention given to Chain for Agricultural Machines.

Rake Chain.
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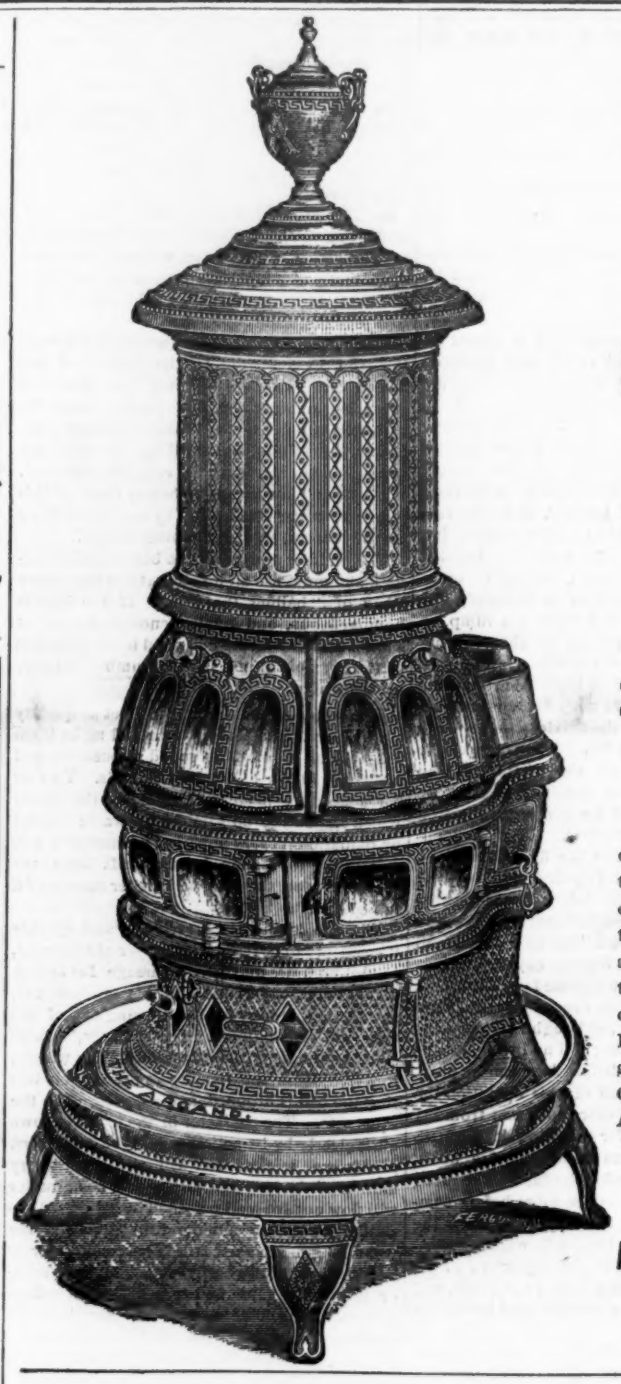
Drill Chain.
Stay Chain.
Lock Chain, &c.,&c.



THE ARGAND Base Burner,

WITH BASE HEATING FLUES,
Patent Clinkerless Grate, And Illuminated Base.
ARRANGED WITH
Spoor's Parlor Stove Furniture
AND THE
New Silver Plated Foot Warming Rail.

DON'T BE DECEIVED

As a still further proof of the SUPERIORITY and POPULARITY of the Argand over all others, such a demand was created in one season that manufacturers of base burners all over the country were obliged either to make new stoves or alter over in some way the old ones so as to combine some of the essential points and to have them in appearance as much like the **ARGAND** as possible. Some have copied so closely that a person not fully posted, seeing the Argand at one store, and some other at another, would almost vouch they were both the same stove. BUT DON'T BE DECEIVED. By careful observance you can distinguish the difference. Go on the principle that if anything is worth COPYING the ORIGINAL is always the best, and when you get the Argand you get the original.

PERRY & CO.,

ALBANY, 115 Hudson Avenue.
NEW YORK, 86 Beekman Street.
CHICAGO, 15 & 17 Lake Street.

The National STOVE POLISH.

This Stove Polish is a strictly pure article, free from all adulteration. It will polish with the greatest ease, and give a brilliant and durable lustre.

NATIONAL STOVE POLISH CO.,
74 Pearl Street, BUFFALO, N. Y.

NEW MODEL DERINGER REVOLVER.

22 Cal. 7 Shot.
An exact model of S. & W. No. 1 Revolver.

This arm is Half Nickel Plated, and is equal in style of finish to the best arms in the country. Quality of workmanship and material first-class, and guaranteed in every respect.
Price less than any other Hinge Barrel Cartridge Revolver in the market.

Sole Agents, EDWARD K. TRYON, Jr. & CO., Dealers in FIRE ARMS.
No. 19 North Sixth Street and No. 220 North Second Street, PHILADELPHIA.

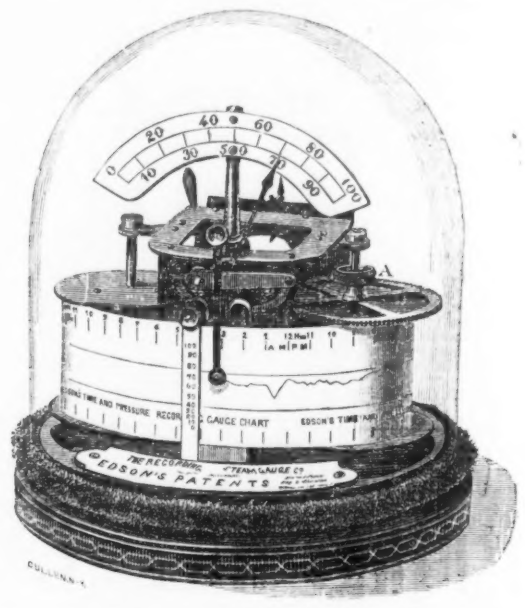
G. W. Bradley's Edge Tools.

Butchers' Cleavers,
Butchers' Choppers,
Axes and Hatchets,
Grub Hoes and Mattocks,
Mill Picks,
Box Chisels and Scrapers,
Ring Bush Hooks,
Axe Eye Bush Hooks,
Socket Bush Hooks,
Watt's Ship Carpenters' Tools,
Carpenters' Drawing Knives,
Coopers' and Turpentine Tools.

FOR SALE BY
N. WEED, 4 & 6 Gold St., N. Y.

Edson's Time and Pressure Recording Gauge.

One of the most necessary things for a steam user to have is a continuous log or record of what goes on in the boiler. Without this he has very little idea of how the boiler is running and to what strains it is subjected. Indeed, the most careful engineer or stoker cannot know as much in regard to the performance of a boiler without an automatically kept log as any one may obtain from an inspection of such a log. The Edson gauge, of which we give an illustration, shows the pressure in the boiler or steam pipes by means of a hand and dial, and in addition makes a tracing upon a ribbon of paper ruled to a scale. The horizontal lines of the ruling indicate pressure per square inch, and the vertical lines the hours of day or night. By simple inspection we can tell in a moment what pressure was carried at any hour in the day. An alarm gong is attached to the gauge, which rings when a fixed limit is attained. This alarm can be operated by electricity, and at a distance from the gauge, so that an alarm may be placed in the office or at a distance from the boiler. This alarm continues to ring until the pressure is relieved, and returns to its normal limit. The automatically registered chart, or log, which one of these gauges makes is a very interesting study, and a great deal of curious information is often obtained from them in reference to the performance of a boiler. For example, we have before us a log of a 24 hour run of a boiler in this city, the fires banked as usual at night. The record begins at 12 o'clock at noon, and continues till 12, noon, the day following. Soon after 12 the pressure begins to fall, and during the hour of intermission is about 20 pounds lower than at the time of shutting down. Just before 1 o'clock the pressure runs up to something like 10 pounds above the average pressure carried, caused, doubtless, by closing the furnace doors too soon. When the engine was started in the afternoon steam fell to 70 pounds, the regular pressure. During the afternoon the pressure was maintained pretty regularly until about 3, when there was a considerable fall, the firing having been neglected. It was then kept up quite regularly till 4:30, when the pressure ran down badly. At five it began to go up, and rose for half an hour when it fell slowly till 6, at which time the engineer banked his fires and the steam fell rapidly, but instead of going down to nearly nothing it only went to 55. At 8 p. m. it had got down to 42, where it stayed for about an hour, and then began to rise slowly, and at 3 in the morning was up to 60, where it remained, rising but slowly till 7 o'clock, when work began. Steam then ran up to 85 lbs., but fell again when the engine started. About once an hour during the forenoon steam fell from 10 to 20 lbs. below the proper average, and had to be brought up again by steady firing. This run was just about an average, the same faults in the management of the boiler occurring every day, the same excessive pressure at night and dangerous rise toward morning; this was, in some cases, very great, showing that the fire was not properly banked. Now these facts could have hardly been found out by the ordinary careful watchfulness of engineers, owners or firemen. The charts are taken from the instrument each day at noon, and another twenty-four hours record begins. The charts are taken by the engineer, and filed away for future reference.



It will be seen that this gauge gives evidence of the time at which any changes in pressure occurs, the length of time they continue and their extent. This gauge is manufactured by M. B. Edson, 91 Liberty street, New York. It is put up in styles suitable both for marine, stationary and locomotive boilers.

The Business Situation in St. Louis.

Mines, Metals and Arts, of St. Louis, discusses the local aspects of business as follows: Few schemes of the speculative order are now being blown, not that speculators are fewer, but the subjects to operate upon are infrequent. Most mining operations that have been on a basis for legitimate work have suffered little damage, particularly the lead mining interests. Lead has steadily risen from 6 cents a pound 18 months ago, to 7 cents at this time. Copper, also, has been fairly elastic, even if down to 18 cents at one time during the panic; it is on a good level now as far as safety is concerned, with a hopeful future.

Of the iron interests of late we have said but little, cause, nothing new to speak about; the old story of dullness sickened us long ago, and where was the sense of repeating an unchanging story? At this writing, excepting in microscopical proportions is there any beneficial change noticeable in the iron industry. At no time in the past fifteen years have so few iron furnaces been in blast in the State of Missouri. Low water in the Ohio has embargoed exports of specular or rich red iron ores; a present rise in the Ohio gives a little hope for ore activity. Stocks of Missouri iron are still too large in producers' hand; strong men hold these irons, but the bottom in values is not known to be definitely reached; hence no motive exists for changing money from an active currency value, into iron that has no specific remunerative value, or a certain value that is above the hazard of costing more than it will sell for. With a slightly increased demand for both raw and finished iron at slightly declining prices, no change in this city can be noted.

The rolling mills of this city are generally employed. The Laclede is running its big mill on single turn on a good range of work; the little mill has been running single since the first of September, but goes on double after today. The plate and sheet iron of the Laclede has lately entered into a somewhat extended use. Rohan & Bros. got the contract for 27 large boilers for the Vulcan Bessemer Steel Works. Into these boilers, and all the sheet iron work attendant, Laclede plate and sheet have entered, and a better job never left a shop than these 27 boilers when started down to the works. The St. Louis Iron and Bolt Co.'s mill is running double steadily, with a liberal number of fair orders on its books. The Vulcan's 40 lb. rail is going down on the Hot Springs Branch Railroad at a good rate. We are sorry to hear it intimated that this road may be delayed over winter in its entry into the Hot Springs Valley. This will be the best piece of light road for money making in the United States; the business is already made for it, both passenger and freight, and if the Iron Mountain and Southern and the Branch can deliver freight for less money over 64 miles of railroad, than the hundreds of teams hitherto employed can haul it from Little Rock, over 45 miles of the military road, they will get all the freight delivery for a vast territory, thereabouts, west and southwest. The other city mills are doing at least single turn work, both for order and store irons. The Great Bessemer machinery under construction with G. B. Allen & Co. for the Vulcan is going on to completion steadily. A lively interest is displayed in filling out some of the rich old mines of Old and New Mexico. Machinery outfits are making in the city at rates so favorable, that if the parties operating the mines have any gumption or skill at all, vast future advantages will accrue to St. Louis manufacturers; still we fear that some of these mining men do not know what they really need.

Lead is improving with the enhanced value of gold.

The Philadelphia *Press* says: There is a prospect of some trouble among the iron workers of Richmond and Kensington. The trade being dull and prices depreciated, it is contemplated by the masters next week to make a temporary reduction of wages. Many of the workmen threaten to strike, and say they will not submit, while others will silently accept the reduction. In most of the foundries the men have been on half or three-quarter time, and they say to submit now to a reduction on this time will render it impossible to sustain their families. The masters declare they must do it or shut down their works, for they would be losing money. A more sensible portion of the men see this and believe it better to have limited work than none at all, and will accept the situation. The want of unanimity may prevent a strike. The mill owners believe they can increase wages to the old standard after the first of the year.

Preliminary work in sinking a shaft on the French coast for the projected tunnel under the channel is announced. The depth of the shaft—328 feet—is more than half as great as the utmost that it is supposed the tunnel may require. The immediate object is probably to assert in whether the formation at the requisite depth agrees with the theory of geologists. A similar shaft was sunk some time ago on the English side of the Channel. Before the tunnel itself is built, there will have to be some arrangement made to provide the many millions of pounds sterling required.

The Lucius W. Pond Forgeries.

A few days ago the business community was startled by the reception of news connecting the name of Hon. Lucius W. Pond, a well known manufacturer of machinery, at Worcester, Mass., with heavy defalcations and forgeries. The Worcester *Gazette*, of the 19th, gives the following particulars of the sad and surprising events, which culminated in a flight from justice, if not in suicide:

Rumors began to circulate last evening that Lucius W. Pond, whose mysterious disappearance has of late so much excited this community, had been guilty of more definite violation of the law than had before been charged upon him. This morning these reports increased and took a more definite shape. It was at last asserted openly that a large portion of the extraordinary amount of paper bearing Pond's name, which has been turning up unexpectedly in every quarter to the bewilderment of the indorsers, was forged. Our reporters have traced up these reports to their source, and are prepared to show what has been ascertained. It is of a character to leave little room for doubt that Mr. Pond has been guilty of this crime against the statutes, and to show that he had reason for either flight or suicide, beyond the immense indebtedness which it was found he had piled up by promiscuous borrowing and and the exchange of "accommodation paper." The suspicion of forgery rose from the fact that Mr. Pond's indorsers found coming in on them notes to the amount of double what they supposed was in circulation—notes of which they had no record and no recollection of signing. Suspicion led to investigation and experiment, and detection followed. Certain of these notes were examined with the microscope and treated with a chemical preparation. It was found, beyond a doubt, that their face had been removed and rewritten, while the indorsements were genuine. The plan was evidently this: The original notes were made payable at Mr. Pond's office, or without naming any particular bank. It thus happened that when they were paid they remained in his possession without any marks of cancellation, or anything to show that they were dead paper. It was then a tolerably easy matter to remove the writing on the face with an acid, and write in fresh dates and amounts and add Mr. Pond's own signature. The indorsements on the back were allowed to remain. In some instances only the dates were changed. In others there was a palpable alteration of both dates, time and amounts. Out of five notes examined this morning, four of them when placed under the microscope showed plainly that they had been altered in this way. Nobody knows how much of Mr. Pond's indebtedness consists of the forged paper, but it is set as high as $100,000 by interested parties. In all these cases the loss will fall, of course, on the money lenders who have been furnishing Mr. Pond with money all this time without detecting the fraud. The indorsers of Mr. Pond will be released from a corresponding amount, and naturally feel somewhat easier. This revelation will cause astonishment and consternation among Mr. Pond's old friends, who have preferred to believe the best of him, notwithstanding the peculiar character of many of the loans which it was discovered he had obtained. It will strengthen greatly the now prevalent belief that he is still alive, and may possibly lead to renewed efforts to discover his hiding place. Mr. Pond's family will have the sympathy of the community in this new form of their calamity.

Death of William E. Morris.—William E. Morris, one of the best known civil engineers in Pennsylvania, died suddenly at his residence, No. 1225 Spruce street, on Friday, 22d inst. He was apparently in his usual health during the day, but was stricken down by heart disease while sitting at the tea table. Mr. Morris has been prominently identified with many of the leading canal and railroad improvements of the country. He was for many years engaged as a civil engineer on the Pennsylvania canals, while they were under the control of the Canal Commissioners. He built the Spring Garden Water Works, and was engineer of the great reservoirs and other works near Hollidaysburg for supplying the main line of the Pennsylvania Canal with water. He was president and engineer of the Germantown and Norristown Railroad in its early days, and was afterward president of the Long Island Railroad, which position he held for several years, until he was elected vice president and acting president of the New York and Harlem Railroad. On resigning this position he lived in retirement for a number of years n Germantown. He built the water works at Doylestown and Bristol, and at the time of his death was erecting water works at Wilmington Del. He was a member of the Water Commission, appointed by the Mayor last June, and whose report concerning the present and future water supply of Philadelphia has been lately published.

The bark Draco is the oldest vessel in the United States. She was built at Duxbury by Reuben and Charles Drew in 1824, and now is over 51 years old. The Draco was built in the most thorough manner and of the best materials, and if no accident occurs, may live as long in the future as she has in the past. She is 251 tons register, double deck, originally a brig, but altered into a bark in 1834. She was first employed in the freighting business, then sold to P. & C. Flint & Co. for the South American trade; next she passed to Samuel J. Bridge, Joseph Knowles and E. Tucker Osborn for the Australian trade, and was finally sold to Mr. J. Bourne, Jr., of New Bedford, for a whaler, and has long been engaged in that business. The Draco was well known in Boston 40 years ago, and was a favorite vessel with all her owners, as she was almost always fortunate in making profitable voyages for them. In 1836 the Draco, in a voyage from Valparaiso to Swansea, Wales, loaded heavily with a cargo of copper ore, passed through the Straits of Magellan, the only vessel of any considerable size that ever made the passage before that time or since.

The Weather Signal Service in Michigan.

The Marquette *Mining Journal* describes in characteristic style the operations of the signal bureau in the Northwest, as follows:

For illustration we will suppose that a storm strikes San Francisco, with the wind blowing directly from the westward; the velocity of the wind, with other particulars, are telegraphed by the sergeant in charge of the station directly to Washington. The Washington authorities, within 10 or 12 hours, report the storm to all stations which it is liab'e to reach (including, naturally enough, many stations which it never reaches at all). Now this is all very well for those places which the storm ultimately reaches, but there being no signal station west of San Francisco, a storm from that direction will always strike the Pacific coast not only without warning, but an interval of 12 to 15 hours invariably elapses before orders are received from Washington to hoist the signals—as the sergeant who first discovers the storm is never allowed to make signals without the mandate of Mr. Shoulder Straps at the national observatory. Shipping may go to the dogs, crops perish and other disasters result, because the sergeant is not, by the present red tape, circumlocutory style of management, allowed to make use of the knowledge he has gained and telegraph ahead at once in the prospective track of the tornado and anticipate its coming. There are also some minor drawbacks to the present system: If a storm is approaching from San Francisco, the sergeant at this station is ordered to hoist his signals, and if the storm passes hundreds of miles to the South of us, as is frequently the case, those vessels which have been awaiting its approach lose much valuable time—provided they rely implicitly upon the service—which we candidly believe they do not, in all cases. At this late season of the year, however, many captains would scarcely put to sea were they to be told by their cabin boy that a storm was approaching; and only last Tuesday morning a number of vessels at this port cleared after waiting between 24 and 48 hours each, for the approach of a gale, which the storm petrel warned them was meandering this way—but which never meandered. The sergeant was probably aware of the utter foolishness of maintaining the signal, but like a dutiful soldier hung the banner on the outer wall—according to orders from Washington, you know. Now, then, let us consider the position of Marquette: There is not a signal station in all the great arc of N., N. W. to N. E. beyond us, and it is well known that the most furious storms which ever visit the lake region prevail from those directions. The result is, no warning can be obtained of what is coming from those points, and a destructive tornado, blowing at the rate of from 40 to 50 miles per hour, strikes us with all its force (and considerable astonishment) as we turn the corner of the street. Our sergeant does not raise his signal, but telegraphs to Washington. When his super-royal nibs, the Sublime Porte of the signal service, receives the intelligence, he coughs slightly, slowly removes his white kids, and, corrugating his brow, becomes lost in the profoundest scientific research—in his mind. By the time he has concluded his grave deliberations the storm has passed over Marquette, and is actively engaged in knocking the shingles out of Green Bay. Then he deliberately telegraphs our sergeant to hoist his storm petrel, and the sergeant, wishing to be respectful, "hoists away," and after going home to change his rubber overcoat for a linen duster, and his water-proof cap for a sunshade, and waiting a respectful length of time, telegraphs his superior, (?) "storm over and weather fair." In about six hours after he is enabled to do, by order from Washington, what a deaf and dumb idiot would have had sufficient sense to do (if permitted) twelve hours before—lower his signal.

Remarkable Antiquarian Discovery.

Professor James R. Gage, of Washington City, an eminent geologist and mineralogist, who has recently been engaged in making extensive explorations regarding the works of the ancient mound builders, reports the discovery of a very remarkable wall in Claiborne county, eighteen miles east of Port Gibson, Mississippi. The discovery has been incidentally mentioned in several papers within the course of a few days, but they do not appear to have realized a tithe of its antiquarian and archæological interest and importance. We condense the particulars of the discovery from the Professor's statement in the Washington *Republican*. It appears that blocks of the stone have been taken by the farmers for building purposes for many years, and it has formed a general quarry for furnishing large blocks of stone. But the farmers have never, it seems, been aware of the antiquarian importance of this wall, which is claimed to be coeval with or anterior to that of Hadrian's famous wall in England. Professor Gage employed laborers and uncovered a portion of the wall twenty feet in width and a hundred and seventy-five feet in length; but on removing the soil here and there he traced it six hundred feet. The workmen uncovered the wall to a depth of six feet, but lower than this the excavations were not continued. Large forest trees of pine and oak, several hundred years old, are growing on top of the wall. The blocks are limestone and belong to the tertiary formation. They were hewn out of this formation and are three feet in length, twenty inches in width and twenty-two inches in thickness. One of these blocks has been shipped to Philadelphia for the Centennial. The wall from which it was taken forms two sides of a rectangle, one part running east and west and the other north and south. The excavations were made near the angle. Three miles due south from this point another portion of the wall reappears on the banks of Bayou Pierce, owing to the washing out of the creek, making it a large exposure, and it is therefore judged that this is a continuation of the ancient wall. The wall was built on the side of a ridge overlooking a swamp which, in ancient times, was evidently the bed of a lake, and the inference is that the wall was erected by the ancient occupants as a barrier against an enemy, or possibly as an ancient levee or dyke erected for the protection of the inhabitants against the encroachments of the lake or the waters of the Mississippi. From other evidences of the wide extent of this wall, as described by Professor Gage, it appears that it included a large area of land, covering probably four hundred square miles, and extending to the Mississippi River. The locality where the wall exists is in the neighborhood of the Natchez Indians, who were found in a state of considerable civilization when first visited by the French, and these remains, it is conjectured by Professor Gage, had some connection with the occupation by the warlike ancestors of this interesting and famous tribe.—*Pittsburgh Commercial.*

The Cleveland (Ohio) Breakwater.

Work upon the new breakwater at Cleveland, Ohio, will be begun within a few days on the shore end of the western portion of the works. Two parallel lines of piling will be driven from the shore, some 200 feet west of the old river bed, for a distance of 1000 feet into the lake, and at right angles to the shore; these piles will be driven as closely together as possible, the two lines being 12 feet apart. The piles will be driven to stand seven feet above the surface of the lake, fastened together by longitudinal timber bolted thereto, and the tops will be covered with heavy timbers, also bolted to the piling, making passage way 15 feet wide. Beyond the piling, extended 1400 feet further into the lake, and from thence in a northeasterly direction for 4800 hundred feet, the extreme end being 300 feet in a direct line from the head of the west pier, a series of cribs will be sunk. These cribs are to be 50 feet long by 22 wide, sufficiently high to allow of their being sunk to the bottom of the lake and extending seven feet above the surface. They will be built on shore, of heavy timbers bolted and held by iron rods, then floated to their proper place, filled with broken stone and sunk as closely together as possible, after which heavy stone will be sunk on either side, to aid in holding them in place; the top of the cribs will be covered with timbers in a manner similar to that on the piles. The wall will be continuous from the shore to its extreme outer end, the only opening being the space, 300 feet in width, between the end of the west pier and the end of the breakwater.

It is the intention of the engineer to carry on the work during the winter months, using the ice, as soon as it forms of sufficient strength, as a means of conveying material into the lake. It is expected that the work can be completed in four years, and the estimated cost is one and three-quarter million dollars.

Clark's Expansive Bit.—This bit has met with more general success than most combination tools, and is considered invaluable by those who have thoroughly tested its merits. Only two sizes are manufactured, each being furnished with two cutters, which may be set in so many different positions that a hole of any desired size up to three inches in diameter may may be bored by it. For amateurs, farmers and persons who have not at their command a complete set of tools, this seems to be just what is needed, and will be thoroughly appreciated by the best mechanics as well. The factory, at Westville, Conn., where this bit is manufactured, is thoroughly fitted with machinery specially adapted for this purpose, all having been invented by Mr. Clark, and built expressly for him. He has, also, several new articles in process of manufacture, which are not yet ready for market, descriptions of which will in time appear in our columns. While Mr. Clark is an inventor he is also a practical mechanic and a thorough business man, for which reason he is eminently qualified for a manufacturer.

It is stated that the beautiful Roman tower which terminated the aqueduct of Quintus Sertorius, in Portugal, has lately been demolished by order of the Municipal Chamber, in order to make a market on the site. This tower contained the conduits, and was an edifice of brick, stone and plaster, and belonged to the period about 75 B. C. It was considered well preserved, and was pronounced by Murphy, who gives a design of it in his book of travels, to be one of the most beautiful relics of Roman architecture in the world. As yet there has been no explanation vouchsafed by the authorities. So let Murray, Bradshaw, Baedeker and others strike out the Tower of Sertorius, one of the glories of Evora, from the list of the sights of Portugese travel. It may be worth while to remark, that until some few years back the beautiful temple of Diana, in the same locality, was used as a slaughter house. It is now, however, cleansed and properly protected.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, Oct. 27, 1875.

The past week has been one of great excitement in the financial markets, and prices have fluctuated through a wider range than for many weeks past. The money market has gained considerable firmness, and borrowers on call have paid 5 @ 6 per cent. On prime business paper the discount rate is still 6 @ 7 per cent. The aggregate averages of the national banks compare as follows for the past two weeks:

	Oct. 16.	Oct. 23.	Differences.
Loans	$284,529,700	$280,584,700	Dec. $3,945,000
Specie	6,389,300	6,406,600	Inc. 17,400
Legal tend's	56,495,400	54,702,900	Dec. 1,792,500
Deposits	228,698,800	223,471,700	Dec. 5,227,100
Circulation	17,812,800	17,816,200	Inc. 3,400

In the gold market there has been an increase in the supply of cash coin, in consequence of which the premium has tended steadily downward. On Thursday the Treasury sold $1,000,000 at 115·94⅓ @ 116·03. The following table shows the daily range of the premium:

	Highest.	Lowest.
Thursday	116⅛	115⅞
Friday	116⅛	115⅝
Saturday	115¼	114⅝
Monday	115⅛	114⅝
Tuesday	115⅝	115⅜
Wednesday	116	115

The market for government bonds is strong and steady, and prices have moved in close sympathy with gold. Railroad mortgages are generally strong, but investment securities are mostly without feature of general interest. We give the closing quotations of governments.

In the stocks speculation has been active, and though irregular, the market has been strong. The principal dealings have been in Lake Shore, Pacific Mail, Western Union and Northwest. Below will be found the quotations of active shares at the close of business to-day.

The following tables show the movements in foreign trade for the week:

IMPORTS.

	1873.	1874.	1875.
Total for week	$5,830,093	$4,760,918	$3,876,055
Prev. reported	328,113,830	322,654,331	272,841,595
Since Jan. 1	$333,943,923	$327,415,249	$276,717,650

Among the imports of general merchandise were articles valued as follows:

	Quant.	Value
Brass goods	11	$1,478
Bronzes	36	9,693
Chains and anchors	9	963
Copper		479
Cutlery	71	16,501
Guns	63	9,027
Hardware	77	5,907
Iron, pig, tons	151	2,989
Iron, sheet, tons	226	39,953
Iron, cotton ties	1,428	2,668
Iron tubes	8	202
Iron, other, tons	155	11,182
Lead, pigs	3,191	19,799
Metal goods	101	19,507
Nails	2	307
Needles	9	5,941
Old metal		3,821
Platina	1	3,574
Per. caps	8	2,797
Saddlery	6	1,516
Steel	1,409	22,568
Tin, boxes	5,626	36,480
Tin, 790 slabs		7,458
Wire	380	9,420
Zinc	179,147	11,308

EXPORTS OF SPECIE.

Total for the week	$608,314
Previously reported	10,227,296
Total since January 1, 1875	$10,835,610
Same time in 1874	5,284,944
Same time in 1873	12,761,087
Same time in 1872	5,301,901

The statistics of imports and exports for the nine months ended with September compare as follows with those of the three preceding years, specie not being included in the comparison:

IMPORTS OF MERCHANDISE FOR NINE MONTHS ENDING SEPT. 30.

1st nine months of 1875	$398,308,555
" " " 1874	442,236,400
" " " 1873	480,763,835
" " " 1872	520,815,066

The exports of September also show a falling off as compared with last year. The shipments of domestic and foreign goods during the month amount to $34,700,342, chiefly in paper values, against $37,370,286 for the same period of 1874. The merchandise exports for the nine months compare as follows with those for the same period of the last three years, the domestic goods being stated in paper values, except the small part that goes out of Pacific ports, and the foreign in gold value:

EXPORTS FOR NINE MONTHS ENDING SEPT. 30.

	Domestic Goods.	Foreign Goods.	Total.
1875	$392,325,927	$9,708,814	$402,034,741
1874	447,359,828	14,895,062	459,274,890
1873	493,743,332	13,270,613	507,013,945
1872	427,012,871	12,441,645	439,454,516

The specie movement has been as follows:

	First 9 mos. of 1875.	First 9 mos. of 1874.
Imports	$16,411,888	$10,832,190
Exports	69,346,425	51,782,850
	$52,934,537	$40,950,660

To compare evenly the gross imports, specie included, with the gross exports, also including specie, it is necessary to have the domestic portion of the exports reduced to gold value; this reduction is made by the Bureau of Statistics, and enables us to make the following comparison:

For the Nine Months.	1875.	1874.
Imports mdse	$398,308,555	$442,236,400
Imports specie	16,411,888	10,832,190
Total imports	$414,720,443	$453,068,590
Decrease	38,368,147	.....
Exports domestic goods, specie value	$44,165,865	407,158,086
Do foreign goods	9,701,814	11,895,062
Do specie	69,346,425	51,782,850
Total exports	$423,221,104	$470,835,998
Decrease	47,614,894	.....

RECAPITULATION.

	1875.	1874.
Total imports	$414,720,443	$453,068,590
Total exports	423,221,104	470,835,998
Excess of exports	$8,500,661	$17,767,408

These figures show the shrinkage in our foreign trade during the expired part of the second year succeeding the great panic. Domestic trade during the past season has shown a marked recovery, and there is reason to believe that the point of greatest depression in the foreign trade has been reached.

Government bonds at the close were quoted as follows:

	Bid.	Asked.
U. S. Currency 6's	123½	123¾
U. S. 6s 1881, reg	121½	121⅝
U. S. 6s. 1881, cou	122⅞	123
U. S. 5-20 1862, reg	115⅜	—
U. S. 5-20 1862, cou	118⅞	—
U. S. 5-20 1864, reg	115¼	115¾
U. S. 5-20 1864, coupon	119	119⅛
U. S. 5-20 1865, reg	116¼	116¾
U. S. 5-20 1865, coupon	119¾	120
U. S. 5-20 1865, reg. new	119⅛	119⅜
U. S. 5-20 1865, coupon	119⅛	119⅜
U. S. 5-20 1867, reg	120⅞	121
U. S. 5-20 1867, coupon	120⅞	121
U. S. 5-20 1868, reg	121	121⅛
U. S. 5-20 1868, coupon	121¼	121⅜
U. S. 10-40 reg	116	116⅛
U. S. 10-40 coupon	117⅛	117⅜
U. S. 5s, 1881, reg	115⅜	115⅝
U. S. 5s, 1881, coupon	117	117⅛
Central Pacific gold bonds	104⅛	105⅛

The latest sales and closing quotations were as follows:

	Bid.	Asked.
Atlantic & Pacific Preferred	4⅜	4½
Atlantic and Pacific Telegraph	17	18¼
Chicago & Northwestern	37⅛	37¾
" " Pref	51	51⅛
Chicago, Rock Island and Pacific	103⅛	103⅞
Chicago, Bur. & Quincy	111½	112
Col., Chic. & Ind. Cent	4⅜	4¾
Clev., Col., Cin. & Ind's	51½	53
Chicago & Alton	94	96
" " Pref	103½	104½
Consolidated Coal	46¾	47
Canton	38	43
Del. Lack. and Western	118¼	118¾
Delaware & Hudson Canal	120¾	121
Adams Express	101	102
American Express	57⅜	58½
United States Express	44	44⅛
Wells, Fargo & Co. Express	78	79
Erie	18⅛	18¾
" Pref		
Harlem	131½	132
Hannibal & St. Joseph	19¾	20¼
" " Pref	23	25
Illinois Central	94	94½
Kansas Pacific		10
Lake Shore	62¼	62⅜
Michigan Central	62	62½
Milwaukee & St. Paul	34⅜	34½
" Pref	62½	63
New York Central	104½	104⅝
New Jersey Central	106	106½
Ohio & Mississippi	16¾	16⅞
Pacific Mail	40⅜	40⅝
Panama	130½	..
Pacific of Missouri	8¾	9
Quicksilver	17	17¼
" Pref	22	23
Tol., Wabash & Western	5⅞	6
Union Pacific	65⅛	65¼
Western Union Telegraph (ex'd)	76⅛	76¾

GENERAL HARDWARE.

Trade continues in much the same condition noticed last week. There are few buyers in town, and prices are without quotable change.

In Foreign Hardware there is little or no animation, and the prices of staple goods are unchanged. We are informed that, owing to strikes among the workmen, the manufacturers of Peter Wright's Vises have advanced these goods 5 per cent. They are quoted in this market at 15¾ @ 16 cents, gold.

The demand for Nails is not large for this season, and although a very low figure has been reached, no inclination to anticipate future requirements has manifested itself. We quote 10d., in lots of 200 kegs and over, $3, net. For smaller orders $3·10 @ $3·15 is a fair quotation.

Geo. Selsor & Co., Philadelphia, have issued the following price list for their Patent Box Coffee Mills. This list is subject to discount 25 @ 30 per cent.:

	Per doz.
No. 40, Dove-tailed, varnished Poplar Box, Iron Hopper, Model Friction Mill	$9·50
No. 50, Dove-tailed, varnished, Poplar Box, Britannia Hopper, Model Friction Mill	10·50
No. 75, Large, dove-tailed, varnished, Poplar Box, Iron Hopper, Treble Anti-Friction Mill	12·50
No. 80, Large, dove-tailed, varnished, Poplar Box, Britannia Hopper, Treble Anti-Friction Mill	13·50
No. 85, Large, dove-tailed, varnished, Ash Box, Britannia Hopper, Treble Anti-Friction Mill	15·00
No. 95, Large, dove-tailed, varnished, Ash Box, large burnished red Metal Hopper, porcelain knob, plated base, extra finished throughout	25·00

NOTE.—On Nos. 40 and 50, the size of top of box is 7¼ inches square. On Nos. 75, 80, 85 and 95, the top of box is 7¾ inches square.

Fernald & Sise, No. 100 Chambers street, have added to their specialties "Parmelee's Patent Expansion Auger Bit" which is an entirely new article in this market. It is simple in its construction, well finished and possesses some novel features which should commend it to the notice of the trade. We take the following from their circular regarding this tool:

The single cutter in the above Bit cuts a hole any size from ¼ inch to 1¼ inches, thus doing away with an extra cutter, which is always liable to be lost. The difficulty of the cutters slipping is obviated by the two set screws. When not in use the cutter can be pushed in flush with the stem of the Bit, making it less liable to injury and taking no more room than a common ½ inch bit. It is strongly made of the best English cast steel. It will bore rapidly and in any wood that other expansion bits are used. Extra cutters can be furnished at a small expense.

These goods were patented Sept. 22, 1874. The No. 1 Bit, which will cut a hole from half to 1¼ inches, lists at $20 per dozen, less discount 25 per cent.

We invite the attention of our readers to the advertisement of J. Clark Wilson & Co., on page 34, in which they illustrate the Northampton Skate Co.'s "Sheffield Steel Club Skates." The manufacturers claim for these goods that, being made all in one piece, without any rivets, they are more durable than the ordinary styles. In the common Skate the straps pass entirely under the Skate, and are prevented from sliding by a pin. Their Club Skate, they claim, is the cheapest Skate of its kind in the market; it is self-adjusting, without straps or buckles, and, like the Strap Skate, is made in one piece. The Strapped Skates are placed on the market at $12 per dozen, list; the Club Skate at $16 per dozen, and both are subject to discount 25 per cent. J. Clark Wilson & Co. will supply these goods from stock.

Abraham Bussing, Secretary of the Ausable Horse Nail Company, quotes Sweets Manufacturing Co. Steel Toe Calks at 13 cents per pound, less discount 10 per cent.; for large orders a more liberal discount will be allowed. He informs us that these Toe Calks are selling better than any similar goods previously handled by them. They are all warranted to be as good as a blacksmith can make from Toe Calk steel.

We have received the following communication:

PHILADELPHIA, Oct. 25, 1875.

Editor of The Iron Age—DEAR SIR: The Hardware committee appointed to solicit subscriptions to the Centennial stock from the Hardware trade doing business direct or through agencies in New York city, give for the benefit of the trade the result thus far. A number of other houses have the matter under consideration, from whom we hope to hear favorably, and will report to your paper when received.

The committee would be pleased to receive subscriptions from the trade throughout the country, and for subscriptions received stock will be sent, and will also be shown as a credit from the particular State the parties reside.

CHARLES J. FIELD,
WILLIAM J. LLOYD,
CHARLES M. GHRISKEY, } Committee.

Name.	No. of shares.	Amount.
J. Clarke Wilson & Co., 81 Beekman st., N. Y.	100	$1,000
P. & F. Corbin, 87 Chambers st., N. Y.	100	1,000
Meriden Cutlery Co., 49 Chambers st., N. Y.	100	1,000
John Russell Cutlery Co., 77 Chambers st., N. Y.	100	1,000
The Hart, Bliven & Mead Mfg. Co., 243 Pearl st., N. Y.	100	1,000
Lamson & Goodnow Mfg. Co., 88 Chambers st., N. Y.	100	1,000
Peck, Stowe & Wilcox Co., 43 Chambers st., N. Y.	100	1,000
John G. Witte & Bro., 75 Chambers st., N. Y.	25	250
Hopkins & Dickinson Mfg. Co., 69 Duane st., N. Y.	25	250
Lau & Garlichs, 72 Beekman st., N. Y.	25	250
Edward Miller & Co., 4 Warren st., N. Y.	50	500
Horace Durrie & Co., 97 Chambers st., N. Y.	25	250
Hermann Boker & Co., 101 Duane st., N. Y.	100	1,000
Londerback, Gilbert & Co., 53 Chambers st., N. Y.	25	250
Howard Sanger & Co., 105 Chambers st., N. Y.	100	1,000
Ausable Horse Nail Co., 35 Chambers st., N. Y.	100	1,000
Meriden Britannia Co., 550 Broadway, N. Y. (Additional subscriptions making 100 shares)	75	750
Graham & Haines, 88 Chambers st., N. Y.	25	250
Wallace & Sons, 89 Chambers st., N. Y.	100	1,000
Chas. Parker, Meriden, Conn.	100	1,000
Alfred Field & Co., 93 Chambers, st., N. Y.	25	250
	1,500	$15,000

The annual convention of the Western Hardware Association, brief mention of which was made in our last issue, closed its session at the Grand Hotel, Cincinnati, on Thursday last. Of the business transacted at this meeting, nothing is made public, none but members being admitted. On Wednesday last the Association were the guests of the hardware trade of Cincinnati, who treated their visitors to a delightful ride through the suburbs, visiting many points of interest. In the evening, the Association was entertained at a banquet by the following manufacturers, who were present, or were represented at the entertainment:

Nicholson File Co.; Bellefonte Works; Hotchkiss Sons; Henry Disston & Sons; Norwalk Lock Co.; E. Yates & Co.; Bridgeport Brass Co.; Frazer, Bell & Loughran; Fernald & Sise; Lewis, Oliver & Phillips; Charles Parker; Peck, Stowe & Wilcox Co.; Parker & Whipple; Norton Iron Works; John Russell Cutlery Co.; Wheeling Hinge Co.; J. L. Haven & Co.; Wiebusch & Hilger Hardware Co.; S. Loring; Wallace & Son; Douglas Axe Co.; Landers, Frary & Clark; Lalance & Grosjean Mfg. Co.; Brown Brothers; Graham & Haines; P. & F. Corbin; A. Field & Co.; Woodruff & McParlin; L. M. Dayton; Perin, Gaff & Co.

The first toast of the evening, "The Western Hardware Association," was responded to by John Nazro, of Milwaukee, who, in the course of his remarks, paid a handsome tribute to the uniform integrity and fair dealing that characterized the manufacturers of America, and expressed his hearty sympathy in favor of protection to home industry. The toast, "The Hardware Board of Cincinnati," was responded to by W. A. McCall. "The Hardware Manufacturers of the West," by Col. L. M. Dayton, of Cincinnati, and "The Hardware Manufacturers of the East," by S. A. Haines, of New York. After the regular toasts were disposed of, the usual after dinner speeches were in order. Hamilton Disston, of Philadelphia, being called upon for a song, responded with "Let Us Help One Another." The melody, which was very beautiful and excellently rendered, was received with great applause. Vincent C. Bradbury, of Cincinnati, favored the company with a well executed flute solo, and after a few hours pleasantly spent, the festivities closed about 12 o'clock. The next annual meeting of the Association will be held in St. Louis. Before the close of the banquet the manufacturers extended to the Western Hardware Association an invitation to another banquet, to be given in St. Louis during the time of their session a year hence. Mr. Nazro, on behalf of the Association, gracefully accepted the invitation.

BRITISH IRON MARKET.

(*Specially reported by cable for The Iron Age.*)

WEDNESDAY, Oct. 27, 1875.

Scotch Pig.—A large business has been done under a steady demand, and prices are firmer. The following are makers' quotations:

Gartsherrie No. 1	72/
Coltness No. 1	77/
Glengarnock No. 1	69/
Eglinton No. 1	63/

Manufactured Iron and Rails are without change to note.

IRON.

American Pig.—Since our last the Thomas Iron Company have reduced the price of No. 1 Foundry Iron to $24 and No. 2 Foundry to $22, which prices are now general. One or two companies, however, adhere to previous prices. Some holders of large stocks and makers of brands not well known are offering No. 1 Foundry at less than $24, and we note the sale of 100 tons North River Iron at $23. The near approach of the close of navigation fails to affect the market beyond slightly increasing the demand, and the usually restricted demand during the winter prevents any hope of an improvement for some time.

The following table shows the state of production in the Lehigh region:

	Furnaces in Blast.	Furnaces out of Blast.	Total.
Carbon	1	2	3
Lehigh Valley	1	2	3
Thomas	3	5	8
Crane	3	3	6
Allentown	5	..	5
Lehigh Iron Co.	..	2	2
Roberts	1	1	2
Saucon	..	2	2
North Penn	..	1	1
Uhler	..	1	1
Glendon	1	4	5
Andover	..	3	3
	15	26	41

We note the sale of 100 tons Crane No. 1 Foundry at $25, less 4 per cent; about 1000 tons Thomas No. 1 Foundry at $24; 200 tons Thomas No. 2 Foundry at $22. A telegram from Montreal reports the suspension, yesterday, of the Moisic Iron Company, with large liabilities. The Morris Run Coal Company, of Pennsylvania, have filed a claim against the company for over $350,000. This company has for a long time been embarrassed, and their suspension occasions little surprise.

Scotch Pig.—The market is firm and steady, being in few hands and well controlled. We note sales of 100 tons Summerlee, at $31·50; 25 tons Coltness, at $33; a few small lots of Eglinton, at $29·50 @ $30. We quote: Coltness, $33; Glengarnock, $32; Gartsherrie, $32·50; Eglinton, $29 50 @ $30.

Bar.—We quote Refined, at Eastern mills, 2·4c. @ 2 5c. per lb. The Catasauqua Manufacturing Company have made an arrangement with their creditors to pay them in bonds at 7 per cent., running a number of years.

Rails.—We hear of some inquiry, but can report no sales. Prices may be quoted $45 @ $50, at mill.

Old Rails.—We note the sale of 600 tons on private terms, and 1000 tons at $26, which we quote as the market price.

Scrap.—The market is firm. We quote: $31 @ $32. We note the sale of 1000 tons Old Car Wheels at $20, 4 months.

METALS.

Copper.—There have been sold to manufacturers during the week 400,000 pounds Lake Superior Copper, on the spot, at 23c. @ 23¼c., and 600,000 pounds ditto "futures" at 23c., part November delivery, and part December and January. The market is sluggish, but unchanged at 23c. @ 23¼c. for Lake, and 23c. for Baltimore. Not the least speculative feeling is noticeable; we doubt that it would show itself even if Lake were obtainable below 23c. London was unaltered on Saturday at £83 for Chili Bars, and £90 Best Selected. We take the following passage from the Houghton *Mining Gazette*, of Lake Superior: "The product of the Calumet and Hecla mine for the current month of October will probably reach 1200 tons, the largest amount of Copper ever before mined in any one month by this company. The north shaft is now down 700 feet, and at that depth the lode is charged with considerable heavy Copper." One of the most reliable statisticians of this city estimates that there will be produced in the United in 1875 2,000,000 pounds in excess of last year. We should consider this a moderate increase, and not likely to influence values, if consumption were full up to its normal condition among us. The protracted state of apathy we have been witnessing in the demand for Copper from manufacturers during the past four months leads to the inference that consumption has fallen off of late, and any excess in the output is, therefore, important in judging of the probable course of prices in the immediate future, unless we can manage to ship off some Copper to Europe. There has been no change in the manufactures of Copper, which we continue to quote as follows: New Sheathing, 30c.; Bolts and Braziers, 31c.; Nails, 38c. @ 39c.; Bronze and Yellow Metal Sheathing, 21c.; Yellow Metal Bolts, 28c.; and ditto Nails, 21c., net cash.

Tin.—The metal continues in the same state of listlessness at this center heretofore referred to, sales being confined to small lots. We quote nominally, in large lots, in gold: Straits, 19¾c.; English Refined, 19¾c.; English Common, 19½c.; and Banca, 24c. Singapore wires to day $23·50 per picul, and is, therefore, unchanged, while London quotes £85 for Straits, adding: "Market quiet, with a limited demand." This is a decline of £1 for the week. Early next week we shall know the extent of the deliveries at London and in Holland for the current month, on which the market will probably turn. If these can be upheld at about the same rate at which they have kept for the past few months, greater stability at or about the ruling figures may be looked forward to with some degree of certainty, opinion being rather in favor than against the metal at London. Should, on the other hand, the deliveries fall off considerably, the chances will be that we shall see a drop such as we have been accustomed to in connection with this metal since the beginning of the year, the statistical position not being a strong one. Tin Plates, despite a continued quiet, keep up well, and we quote, gold, per box, ordinary brands, as follows: Charcoal Bright, $7·25 @ $7·50; ditto Ternes, $7; Coke Tin, $6·50; and ditto Terns, $6·12½ @ $6·25.

Lead.—Sales in our midst have been restricted to 100 tons Domestic, at 5·62½c. @ 5·70c., gold, trade therein remaining a dragging one. At St. Louis the market for soft Missouri is firm at 7c. @ 7¼c., currency; freight is so high that at these prices it could not be laid down here for less than 7⅝c., currency. We have seen a private letter from there, just to hand, which expresses itself to the following effect: "Freights are so high that we cannot ship East; consequently there will be an accumulation of stock after November, and we may then decline. The reports which reach us as regards the output at the Western mines are very favorable; the prospects are that there will be a good supply of bullion." We hear of nothing transpired in common Foreign Lead here, and still quote the same nominally 7½c. @ 7¼c., gold. In Europe the firmness thus far prevalent has suffered no change. The manufactures of lead remain as before, at 8¾c. for Bar and Pipe, and 9½c. for Sheet, less 10 per cent.

Spelter and Zinc.—A telegram came to hand from the West to-day, according to which the combination people have raised their selling price of Domestic Spelter to 7·40c., currency, less 1 per cent., or 30 days. As it is it has not exhibited much briskness at 7¼c., currency, less 1 per cent. Foreign Spelter has preserved the same state of inactivity, both on the spot and to arrive, and we leave unaltered our previous quotation of 7·15c. @ 7·37½c., gold. Sheet Zinc remains firm at 9c. @ 9⅛c., gold, as to quantity.

Antimony.—A moderate jobbing trade is doing at 13¾c. @ 14c., gold, for Foreign, as to quantity. The stock has been reduced by degrees to a small figure. London is unchanged at £59.

IMPORTATIONS.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending Oct. 26, 1875:

Hardware.

Booth R. W.
Guns, cs., 2
Pans, cs., 2
Brown Bros. & Co.
Iron wire rope, coils, 350
Boker Hermann & Co.
Mdse. pkgs., 2
Packages, 8
Shovels, c .. 6
Barton, Alexander & Waller,
Mdse. pkgs., 2
Crasemann J.
Nails, bbls., 11
Cases, 7
Calhoun, Robbins & Co.
Cases, 4
Carey Samuel,
Grindstones, cks., 11
Degraw, Aymer & Co.
Chains, cks., 10
Chains, 7
Drexel, Morgan & Co.
Files, cs., 1
Cutlery, cs., 1
Fuller Bros.
Mdse. pkgs., 2
Field A. & Co.
Chains, cks., 20
Anvils, 200
Cases, 30
Gillespie J. D. C.
Cases, 29
Grocers' Bank.
Cases, 17
Hamm acher A. & Co.
Cases, 15
Homer, Foote & Co.
Files, cks., 11
Hildick A. H. & Co.
Chains, 2
Chains, cks., 8
King, Briggs & Co.
Mdse. pkgs., 10
Laughland & Co
Netting, cs., 3
Wire, bdls., 2
Lau & Garlichs.
Mdse. pkgs., 2
Wadding, cs., 4
Lamarche H.
Arms, cs., 23
Moore's J. P. Sons.
Mdse. pkgs., 4
Wadding, cs., 3
Per. caps, cs., 6
Empty cartridge cs., cs., 2
Moore H.
Files, cks., 6
Merchants' Dispatch Co.
Wire rope, pkgs., 2
Cases, 3
Macy R. H. & Co.
Cases, 3
Mason John W. & Co.
Wire rope, coils, 7
Remington E. & Sons,
Gun stocks, 5000
Rosenthal J. & Co.
Cases, 2
Schoverling & Daly,
Cases, 6
Schall & Co.
Cases, 4
Sawyer John,
Wire rope, coils, 2
Schuyler, Hartley & Graham,
Guns, cs., 5
Tomes Francis & Co.
Guns, cs., 2
Van Wart & McCoy,
Packages, 4
Wiebusch & Hilger Mfg. Co.
Anvils, 313
Packages, 15
Wolffe N. & Co.
Casks, 14
Western Union Telegr'ph Co.
Wire, lots, 250
Order.
Files, cks., 1
Files, cs., 3
Chains, cks., 2
Guns, cs., 3

Iron.

Champion H.
Cast, pkgs., 75
Darrell & Co.
Barrels, 9
Goddard & Bros.
Sheet, bxs., 100
Laughland & Co.
Hay bands, bdls., 375
Naylor & Co.
Steel iron, bars, 6151
Bars, 18,109
Wright C. L. & Co.
Bars, 6
Order.
Russian sheet, pkgs., 100
Pig, tons, 200
Bars, 6454

Steel.

Brown Wm.
Bundles, 323
Cases, 3
Hagill Chas. & Co.
Bundles, 248
Bars, 4
Cases, 12
Lang W. Bailey & Co.
Tire blanks, 91
Morgan John.
Cases, 14
Bundles, 15
Naylor & Co.
Tires, 42
Cast, bars, 6
Bar steel, cs., 16
Robbins C. & Sons,
Bundles, 115
Wessel Aug.
Bundles, 1
Woodford W. O.
Cases, 70
Order.
Bales, 643
Cases, 3
Bundles, 445
Bars, 8
Casks, 2

Metals.

Bruce & Cook.
Tin plates, bxs., 500
Cort N. L. & Co.
Tin plates, bxs., 565
Tin, bxs. 250
Crasemann J.
Tin plates, bxs., 20
Lead, cks., 1
Canadian Bank of Commerce,
Tin plates, bxs., 800
Darrell & Co.
Scrap copper, tcs., 1
Scrap, tcs., 1
Brass, bbls., 2
Loose copper, pcs., 7
Naylor & Co.
Tin plates, bxs., 1610
Phelps, Dodge & Co.
Tin plates, bxs., 4158
Williams & Guion,
Tin plates, bxs., 368
Order.
Tin, slabs, 446
Tin plates, bxs., 5425
Tin, bxs., 725

COAL.

The market for Anthracite is rather dull. Very little has been done at wholesale, as dealers and manufacturers are well supplied. At the meeting of the Coal combination, held Sept. 20th, it was agreed that prices of Coal should not be advanced for the month of November. The market for Cumberland is quiet. Freights are somewhat higher, and vessels are scarce at the shipping ports.

The quantity of Coal shipped from the Schuylkill region during the past week was, by rail, 122,214 tons; by canal, 33,941 tons; total, 156,155 tons, against 152,711 tons for the corresponding period of last year. Increase, 3444 tons. The quantity so far this year foots up 3,455,568 tons, against 3,771,492 tons for same period last year; decrease, 315,824 tons.

The quantity sent from all the regions for the week was: Anthracite, 567,841 tons; Bituminous, 91,298 tons; total, 658,779 tons, against 526,954 tons Anthracite, and 83,058 tons Bituminous; total, 610,012 tons for the corresponding period of last year. Increase of Anthracite, 40,527 tons; increase of Bituminous, 8240 tons. Total increase, 48,767 tons.

The quantity sent from all the regions so far this year was 15,722,456 tons Anthracite, and 3,115,738 tons Bituminous. Total, 18,938,194 tons, against 16,026,488 tons Anthracite, and 2,901,242 tons Bituminous; total, 18,729,730 tons for the same period of last year. Decrease of Anthracite, 304,032tons; increase of Bituminous, 214,496 tons.

The following are the cargo prices of the different companies' Coal, delivered at the various shipping ports near New York during the month of November:

	L.	Str.	Gr.	Egg	Sto.	Chi
Lackawanna D. & H.	$5 05	5 15	5 25	5 65	6 10	4 95
Wilkesbarre	5 05	5 15	5 25	5 65	6 10	4 95
Plymouth Red Ash, net	....	....	5 25	5 65	6 10	4 95
Pittston, open market	5 10	5 10	5 20	5 40	5 85	4 85
Scranton	5 00	5 10	5 20	5 45	5 90	4 90
Old Company's Summit	5 55	....	5 55	5 65	6 10	5 10
N. Y. Lehigh Coal Ex	5 55	....	5 55	5 65	6 10	5 10
Honey Brook Lehigh	5 55	....	5 55	5 65	6 10	5 10

Freights from the above shipping ports to New York city are as follows, including the unloading:

Hoboken	40	Rondout	50
Weehawken	40	Elizabethport	40
Port Johnston	40	South Amboy	45

We quote as follows: Anthracite, $4·95 @ $6·10; Cumberland, $6·25 @ $6·75; West Virginia, $6·75 @ $8; James River Steam, $6·25; James River Carbonite, $9 @ $9·50; Kanawha House, $11·50; American Gas, $6·75 @ $7·25; American Cannel, $12 @ $14; Pennsylvania and Westmoreland, $6·75; Murphy Run, $6·50; Newburgh Orrel, $6·50; Sterling Ohio, $10; Ince Hall, $17 @ $18; Liverpool House Cannel, $17; Liverpool Gas, $12; Newcastle Gas, $7; Scotch, $7·50 @ $8.

The Coal transported over the Cumberland Branch Railroad during the week ending Oct. 23, 1875, amounted to 6101 tons, as against 5057 tons shipped in the corresponding period of last year, showing an increase of 1044 tons. Over the Cumberland and Pennsylvania Railroad, for the same period, the shipments were 40,364 tons, against 43,360 tons shipped in 1874, a decrease of 2996 tons. The aggregate amount of Cumberland Coal shipped by the various companies so far this year amounts to 1,915,873 tons.

OLD METALS, PAPER STOCK, &c.

Business in Old Metals is very dull. There is no special demand for anything in that line, and stocks are consequently accumulating. The market for Rags and Paper Stock is beginning to show signs of activity. Canvas Cotton No. 2, and Mixed Woolens, are in good demand, and prices are firm. We have no change to note in any of our quotations under this heading, which are the purchasing prices that are offered by dealers:

Old Metals.—Copper, 16c. @ 17c. per lb.; Yellow Metal, 11c.; Brass, 10c. @ 12c.; Composition, heavy, 13c. @ 14c.; Lead, solid, 5½c.; Tea Lead, 4½c.; Zinc, 4¼c. @ 4½c.; Pewter, No. 1, 18c.; do., No. 2, 8c. @ 12c.; Spelter, 5c. @ 5¾c., Wrought Iron, 1c.; Sheet do., ½c.; Cast, do., ½c.; Machinery, do., ¾c.

Rags, &c.—Canvas, Linen, 4¾c. @ 5¼c.; do. Cotton, No 1, 5¾c. @ 6¼c.; No. 2, 2¼c.; White, No. 1, 6¼c.; No. 2, 4c.; Colored, do., 2c. @ 2½c.; Mixed, Woolen, 2c. @ 3c.; Soft, do., 5c. @ 5½c.; Gunny Bagging, 1¼c.; Jute Butts, 1¾c. @ 2c.; Kentucky Bagging, 3c.; Book Stock, 3c.; Waste Paper and Scraps, 1¼c.; Kentucky Bale Rope, 4c.; Oakum Junk, No. 1, 4½ @ 5c.; do. No. 2, 3c.; Tarred Shaking, 1c. @ 1¼c.; Grass Rope, 3c.

PHILADELPHIA.

PHILADELPHIA, Oct. 26, 1875.

The season approaches to the close of canal navigation, and whatever of activity there is in the Iron market is due to this, although it has not yet amounted to any very material increase of the trade in Pig metal. About 10,000 tons a week will cover the transactions in Pig Iron in this market at present, although there are, of course, very many sales of small lots which are never reported. The actual product continues to average about the same, although some new furnaces are blowing in. The output will not be materially increased before spring, it is thought, nor will prices materially alter, although a spurt of business would follow any threatening of ice, and possibly advance prices $1 or $2 per ton. Ores are very low, compared to Pig metal, as are Bars, and both producers of the one and manufacturers of the other complain of this. Manufactured Iron is nominally the same, but actually a little better than at our last. Rails sell freely, and have more inquiry than anything else. Old Rails and Muck, as well as Scrap, are all quiet. There is a report of trouble with puddlers at hand here; as however the principal mills have constant trouble with puddlers, it is not likely to curtail production, although wages will be lowered and a strike may come at any time, and would, indeed, be rather beneficial than otherwise to the Bar mills.

The range of prices is somewhat difficult to quote, for, while some furnace companies refuse the idea of $25 for No. 1, others sell actually under this, and relative quotations for other grades. We quote as follows:

PIG IRON.—No. 1 Foundry, $25; No. 2, $22; Gray Forge, $21 to $22.

BARS.—2·6 to 2·7 per lb.

RAILS.—$45 to $50, at works, for Iron; $70 to $71, at works, for Steel.

OLD RAILS.—$26 to $26 50.

SCRAP.—$29 to $32.

The sales include, among others, the following, viz.: 3000 tons No. 1 extra, 2200 tons No. 2 extra and 2000 tons Gray Forge. Note sale of 6000 tons new Rails for Western delivery, made by Penn mill, private terms; 1000 tons light Rails, 30s and 35s, at quotations; 1000 tons Old Rails, at $26, delivered; 400 tons No. 1 Wrought Scrap, equal $29; 100 tons No. 1 Wrought Scrap, equal $32. Several large orders for new Rails, both for Western and tide-water delivery, are now pending, which will be closed probably this week.

PITTSBURGH.

PITTSBURGH, Oct. 25, 1875.

PIG IRON.—The market remains in much the same condition noted from week to week for some time past. There has been no improvement to report during the past week, and while hopes are still entertained that there will soon be a change for the better, the outlook at the present writing is not very encouraging. Owing to recent suspensions, sellers are exercising more caution than heretofore, and buyers who are considered doubtful, and who at one time could obtain all the Pig they wanted on credit, will now have to plank down the cash. The demand, however, continues very light, being restricted entirely to small lots for keeping up mixture, and the indications are that this hand-to-mouth policy will be closely adhered to for some time to come, as the mills, in the present unsatisfactory and depressed condition of affairs, will buy no more than they can possibly help. Prices have undergone no recent change, although the general position of the market is favorable to buyers, and but for the fact that the stock of Mill Iron is very much reduced, and the production down lower than it has been for several years, the shrinkage in value would have been greater than it has been. There has been an increased movement in Charcoal Foundry Irons within the past week or two, and as the most of the sales reported were on private terms, it is but fair to infer that the rates were low. Furthermore, it is almost certain that buyers would not have bought so liberally had not some inducement been offered, as some of them have been induced to anticipate future wants.

QUOTATIONS.

No. 1 Foundry	$26 @ $27—4 mos
No. 2 Foundry	$24 @ $25—4 mos
Gray Forge	$23 @ $24—4 mos
White and Mottled	$21 @ $22—4 mos
Hot Blast Charcoal	$25 @ $30—4 mos
Cold Blast Charcoal	$30 @ $35—4 mos

MANUFACTURED IRON.—The general situation remains substantially as noted in my last report; trade continues dull and unsatisfactory, orders are coming forward sparingly, and prices continue unsettled and unremunerative. Negotiations are now pending with a view to reducing the cost of manufacture, by curtailing the cost of puddling, rolling, etc., etc.' and if successful the mills will be continued in operation, but if the men refuse to accede to the reduction, a general suspension, for a time, is probable. It is likely, however, that the matter will be amicably arranged, as the puddlers and rollers appear to realize the situation, and they will doubtless submit to a reduction in preference to being thrown out of employment with winter fast setting in. There is no question but the mills have been losing money right along, as prices for ordinary sizes do not cover actual cost, and as there is no chance, in consequence of a strong competition, to put up rates, the only alternative is to reduce the cost of manufacture; and, as already stated, steps with this object in view have been taken.

NAILS.—There are still some orders coming forward, but trade is dull, unusually so for this season of the year, but few, if any, of the factories are working more than half time. There are not sufficient orders to absorb a full production, and manufacturers are determined not to accumulate stock in the present condition of affairs. Prices may be quoted at $2·85 to $2·90, 60 days, with two per cent. discount off for cash. Horse Shoes have been dull, but an increased trade is expected, 4¾ cents cash. Mule Shoes, 5¾ cents.

SCRAP IRON—Continues very dull; dealers report that there is not enough doing to establish quotations. No. 1 Railroad Wrought Scrap quotable, nominally, at $1·30 to $1·40. Car Wheels very dull; offering at $24, 4 months, with no buyers. There was a sale of good mixed Scrap the other day at 1¼, delivered. A great deal of the Scrap in the yards of dealers could not be sold to cover cost.

STEEL.—The Steel mills are all in operation, and business is holding on better than was expected, but in this, as in every other branch of business, it is complained that prices are unremunerative.

The Pittsburgh *Commercial* of Oct. 23, says: The sales of pig metal reported below show a little more activity than last week, but also indicate that only small lots are required for immediate use, and lots offered (because of inferior grade or quality) at a low price find purchasers. It cannot be said that there is any improvement in price, but it is evident that holders of standard quality red short metal that does not contain an excess of mill cinder or low grade ore are very firm at $24, 4 months, and well satisfied that they will obtain that price or more by holding on a few weeks longer. We are reported the following sales:

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR ORE.

200 tons gray forge	$24·00—4 mos.
200 tons white and mottled	20·00—cash.
100 tons gray forge	23·25—4 mos.
100 tons gray forge	23·00—4 mos.
100 tons gray forge	23·00—4 mos.
50 tons gray forge	24·00—4 mos.
50 tons neutral forge	23·00—4 mos.
50 tons neutral forge	23·00—4 mos.
40 tons gray forge	23·50—4 mos.
20 tons No. 1 foundry	27·00—4 mos.

CONNELLSVILLE COKE.

200 tons close mottled and white	private terms.
30 tons No. 2 foundry	$24·00—cash.
10 tons No. 2 foundry	25·00—4 mos.

ALLEGHENY COKE.

200 tons gray forge	$21·50—cash.
150 tons, a mixed lot	private terms.

CHARCOAL.

110 tons No. 2 h. r.	private terms.
60 tons No. 2 h. r.	private terms.
25 tons No. 1 h. r.	private terms.
10 tons No. 1 h. r.	$28·00—4 mos.

BOSTON.

OCT. 23.—*Pig* is, if anything, more unsettled than ever, and buyers patch out their small wants with more or less indifference to brand, the temptations being in quotations, which, as previously reported, are gauged upon the ideas of the buyers' postings upon the market. The reports from the primary markets, both through the press and by private correspondence, indicate that the undercurrent of demoralization, so long prevalent in this market, has cropped out at home, that holders, abandoning the idea of breaking the markets at the outports, and holding up their primary points, have turned in for selling, as it were, to "most any feller" who looked rugged enough to carry a load. In fact, just now Pig Iron seems to want to shift from banks and note brokers who control by advances. In this market prices are hardly quotable. *Bar* has hardly had as good a trade as was reported a week ago. There is no advance on $57·50 for warranted, either in round lots or in a jobbing way. A little spurt occurred early in the week in Shafting Irons, but at prices incidental with favorite brands, and current quotations on refined are $57·50 and common at $51. *Steel* has had a fair week in machinery, and a little doing in tool. The Ames Plow meeting has had a depressing influence, and dealers are again exercising renewed circumspection over credits. Prices are firm on foreign and American. We quote: American Tool, 14c. to 15c.; American Machinery, 9c. to 9½c.; Bessemer Tires, 7c. to 7½c.; Sweet's Excelsior Tire, 8½c. to 12c.; English Tool, 16c. to 18c., gold. *Copper* is dull and steady, with manufacturers offering to take small lots at 23½c. and holders asking 23¾c. There is nothing new as regards the situation except the associated press dispatches that navigation is to close early on the lakes, and the quoted prospects that shipments of Copper are to immediately cease—possibly entertaining gossip for newspaper publishers to pay for, but of no practical use to the mining companies, the thing being so thin and following so closely upon the manufacturers' meeting. For manufacturers we quote: New Sheathing, 30c.; Bolts and Braziers, 31c.; Yellow Metal Bolts, 20c. to 29c. *Lead* is having very little business, prices feeling a shade easier. We quote Pig 5⅝c. to 5¾c. for Domestic, and 6⅝c. to 6¼c. for Foreign; Sheet and Pipe Lead, 9c., currency; Tin Lined Pipe, 10½c.; Bar Lead, 9c., less usual trade or 10 per cent. discount. *Antimony* is firm, with very little doing, quoting from 13¼c. to 13½c. as to lots bought. *Spelter* is strong and dull at $7·55, 30 days, and $7·40, prompt cash, all currency. Silesian is having a trivial business at $7·30. *Tin* stands heavy and unchanged, buyers and sellers apart, without any peculiar interest with either party. We quote: Straits, 20c.; Banca, 24c.; Refined English, 19¾c. to 20c., gold. Plates are active; we quote Charcoal I. C., $7·25 to $7·75; Coke, $6·50 to $6·75; and Terne at $6·15 to $6·50, gold.—*Com. Bulletin.*

CINCINNATI.

Messrs. L. R. HULL & Co., under date of Oct. 25, write us as follows: The market is quiet, with little of real importance to advise. Purchases are principally confined to actual wants of consumers, and no speculative ripple can be discerned. Quotations remain about as last reported:

HOT BLAST CHARCOAL.

Hanging Rock No. 1	₮ ton.	$25·00 @ 26·00—4 mos.
" " No. 2		23·00 @ 24·00—4 mos.
" " Forge		21·00 @ 22·00—4 mos.
Southern Brands No. 1		23·00 @ 24·00—4 mos.
" Forge		21·00 @ —4 mos.
Virginia No. 1		24·00 @ 25·00—4 mos
" No. 2		22·50 @ 23·00—4 mos.
" Forge		21·00 @ 22·00—4 mos

HOT BLAST STONE COAL AND COKE.

Hanging Rock No. 1	₮ ton.	$23·00 @ 24·00—4 mos.
" " Forge		21·00 @ —4 mos.
Red Short No. 1		27·00 @ —4 mos.
" Forge		24·00 @ —4 mos.
Am. Scotch, No. 1		24·00 @ 25·00—4 mos.

COLD BLAST CHARCOAL.

Hanging Rock Car Wheel	₮ tn.	$40·00 @ 50·00—4 mos.
Missouri " "		35·00 @ 40·00—4 mos.
Southern Br'ds " "		30·00 @ 40·00—4 mos.
Machinery and Forge		30·00 @ 35·00—4 mos.
Blooms		70·00 @ 90·00—4 mos.

ST. LOUIS.

Messrs. SPOONER & COLLINS, Iron commission agents, 409 North Third street, St. Louis, under date of Oct. 21, report the Iron market as follows: We have little or no change to report in the condition of our market. The demand is rather good, but prices are extremely low, and from present prospects will remain so. We quote on 4 months' time.

Mo. Stone Coal, No. 1 F'dry.		$27·00 @ 28·00—4 mos.
" " No. 2 F'dry.		25·00 @ 26·00—4 mos.
" " No. 1 Mill		23·50 @ 24·00—4 mos.
" Charcoal, No. 1 F'dry		27·00 @ 28·00—4 mos.
" " No. 2 F'dry		25·00 @ 26·00—4 mos.
" " No. 1 Mill		23·50 @ 24·00—4 mos.
Tenn. Charcoal No. 1 F'dry.		26·00 @ 27·00—4 mos.
" " No. 2 F'dry		25·00 @ 26·00—4 mos.
" " No. 1 Mill		24·00 @ 25·00—4 mos.
Georgia Coke No. 1 Mill		25·00 @ —4 mos.
" " No. 2 Mill		24·00 @ —4 mos.
H. R. Charcoal No. 1 F'dry		27·00 @ 29·00—4 mos.
H. R. " No. 2 F'dry		25·00 @ 27·00—4 mos.
H. R. " No. 1 Mill		25·00 @ 26·00—4 mos.
Massillon, A No. 1 Iron		35·00 @ 36·00—4 mos.
" B, No. 1 Iron		32·00 @ 33·00—4 mos.
" No. 2 Iron		30·00 @ 31·00—4 mos.
Cold Blast Car Wheel, Mo		32·00 @ 35·00—4 mos.
" " Tenn.		32·00 @ 35·00—4 mos.
" " Ala.		33·00 @ 35·00—4 mos.
" " Hanging Rock		50·00 @ 53·00—4 mos.
No. 1 Wrought Scrap		1c. per lb.
Heavy Cast "		9·10c. "
Light Cast "		5·10c. "

CLEVELAND.

Messrs. C. E. BINGHAM & Co., 25 West Main street, under date of Oct. 25, quote the Iron market as follows, 4 mos. time:

FOUNDRY IRON.

No. 1 Lake Superior Charcoal	$21·00—4 m.
No. 2 " "	20·00—4 m.
No. 1 Anthracite	27·50—4 m.
No. 2 "	25·50—4 m.
No. 1 Bituminous	27·00—4 m.
No. 2 "	25·50—4 m.
No. 1, Cherry Valley Am. Scotch	31·00—4 m.
B—1 " "	28·50—4 m.
No. 2, " "	27·50—4 m.
No. 1 Massillon	30·50—4 m.
B—1	28·00—4 m.
No. 2	25·50—4 m.

CAR WHEEL AND MALLEABLE IRON.

No. 3 Lake Superior Charcoal	$29·00—4 m.
No. 4 " "	31·00—4 m.
Nos. 5 & 6 " "	32·50—4 m.

BESSEMER IRON.

Nos. 1 and 2 Lake Superior Charcoal	$30·50—4 m.

FORGE IRON.

No. 1 Gray	$24·50—4 m.
White and Mottled	23·50—4 m.

RICHMOND.

Mr. ASA SNYDER, Iron Merchant and Furnace Agent, Richmond, Va., writes as follows under date of Oct. 25: Shipments of desirable Wheel Irons continue active, and prices are well maintained. The stock of new Irons—cold blast charcoal—is gradually being reduced by reason of the very low figures at which they are offering. No stock of any kind is now accumulating.

Virginia cold blast Charcoal Pig Irons		$30·00 @ 35·00
" hot " " "		28·00 @ 32·00
Va. hot blast Coke Pig Iron, No. 1 ex.		26·00 @ 27·00
" " " " No. 2 ex.		25·00 @ 26·00
" " " " No. 3 ex.		24·00 @ 25·00
Virginia Anthracite. No. 1 ex		27·00 @ 28·00
" " No. 2 ex		26·00 @ 27·00

BALTIMORE.

Messrs. WYETH & BROTHER, Iron and Steel merchants, South Charles and Lombard streets, report us the following prices under date of Oct. 26: Trade continues ruling excessively quiet, and sales are freely made shading quotation figures 1-10c. per pound on manufactured Irons, and we quote the market depressed with list weak.

AMERICAN REFINED BAR IRON.

1 to 6 wide by ⅛ to 1 thick	2·6-10 to 2 7-10c. ₮ lb.
1 to 4½ wide by 1½ to 2 thick	
Round and square, ordinary sizes, from ⅜ to 2 inclusive	2 6-10 to 2 7-10c. "
Hoop Iron, 1½ wide and upward	4½ to 4¾c. "
Band Iron, from 1½ to 4 in. wide	3¾ to 3½c. "
Horse Shoe Iron ¾ to 1 wide by ⅜ to ½ thick	4 to 4¼c. "
Norway Nail Rods	7 to 7¼c. "
Black Diamond Cast Steel, Flats, Squares and Octagon, ordinary sizes	15½ to 16c. "
Machinery Steel	11 to 11½c. "
Cast Spring Steel	10 to 10½c. "
Homogeneous Steel Plate	10½c. "
Perkins' Horse Shoes, per keg of 100 lbs	$5·12½
" Mule Shoes " "	6·12½

Common Horse Nails, from 14c. to 18c. per pound.

	10	9	8	7	6	
Putnam Horse Nails	23	24	25	26	28c.	per lb.
	10	9	8	7	6	
Globe Horse Nails	23	24	25	26	28c.	per lb.

R. R. Spikes, 5½ by 9-16 at 3c. to 3¼c. per lb.

FOREIGN.

FRANCE.

(*Moniteur des Interets Materiels*).

PARIS, Oct. 10, 1875.—*Metals.*—The European metal markets have quieted down considerably once more, and business has been on a restricted scale. Holders early in the week still showed a good deal of firmness, in spite of the rising discount rate at some Continental centers; finally, however, some from among them seemed to prefer a realization of profits, especially the speculative owners of Tin, and their manifest willingness to shade prices produced the effect of more reluctance on the part of purchasers to go on laying in supplies, hence a gradual weakness, and some slight giving way. This is evidently nothing but a natural recoil from too rapid an advance, and mainly brought about by apprehensions that money may become tighter even at London, and that holders of metals for a rise may find it less easy to carry large quantities on borrowed capital. Transactions on credit have been much curtailed in Europe pretty much everywhere; the least disturbance in the money market has, therefore, a more immediate effect on current values than was formerly the case, and this extreme sensitiveness manifests itself on the present occasion. *Copper* has remained comparatively firm, and in some quarters has even improved, the charters on the West Coast being moderate in amount; but as the demand for manufactured is less active in England and elsewhere, the chances are that we shall remain about steady for the present until financial matters wear a more reassuring look. We have been very quiet here, without change in quotations. We quote, deliverable at Havre, Chili Bars, 217·50 francs; Common ditto, 212·50; English Tough Cake, 225; and pure Corocoro Ore, 215. At Marseilles Copper continues well supported on the basis of 215 francs for small Ingots. *Tin.*—Although the mail accounts from Australia to the beginning of August are favorable, inasmuch as production had been curtailed, and the surplus was not likely to exceed 6000 tons for export to England during the current year, the metal has declined again a trifle at London. The Australian advices predict, on the other hand, a larger export than last year to China, and some to California; if to the latter country, it will finally go to New York, which will then require less from other sources. We have been quiet here at the following rates: Banca, at Havre or Paris, 237·50; Straits, 227·50; and English, at Havre or Rouen, 235. The upward tendency continues at Marseilles, where the metal advanced 10 francs during the past fortnight. Banca and Billiton were worth there 220 francs. *Lead* has been quiet everywhere, but has, nevertheless, stood its ground tolerably well. The quotation for all descriptions here remains 59. Marseilles has become quiet at 54. There are no features of special moment in the *Spelter* markets, with moderate dealings and great steadiness. Little doing here, and but slight fluctuations. We quote Silesian kinds, at Havre, 65·50 to 66 francs. Marseilles unaltered, but Sheet Zinc rising. *Iron.*—We are glad to announce an improvement in values, slight though the same may be. Throughout the summer our works have had a steady current of small orders pouring in upon them; this week these orders have gained in magnitude. The advance thus far is insignificant, but our Iron masters have not been spoiled during the past two years, and are resigned to a slow approach of the revival so long hoped for. Affinage Pig is as yet quiet, but Moulage is in demand. *Coal* is steady, on the whole, though less active for household purposes on account of the mild weather.

BELGIUM.

(*Revue Universelle*).

BRUSSELS, October 10, 1875.—*Iron.*—Our Iron masters begin to express more confidence in the future. Prices have now become steadier. The English, also, are becoming better customers of ours daily; thus, a single English firm took from one of our establishments 1000 tons of Iron during the month of September. Belgian Iron is again rising in favor in England, and the most competent judges now proclaim that it is unexceptionable in quality. Belgian Pig Iron is less firm for the present, despite the better advices from England and Luxembourg. It should be remarked, however, that the slight improvement in England is deemed by many as likely to be of short duration, since, according to them, it is due merely to increased activity for the Baltic previous to the close of navigation. Sheet Iron is in good request. Our Rail manufacturers have a sufficient amount of commands on hand to keep them busy for some time to come. Belgian Iron manufacturers have of late been making great efforts for the purpose of extending their connections abroad, and our export to England, Spain, Italy, Russia, Switzerland, Holland and China is assuming most satisfactory proportions, while Germany and France have also continued to be customers of ours. This has compensated them in a measure for the prostration of matters in the line at home. *Coal.*—Prices are becoming firmer by degrees, and although the improvement actually obtained is as yet but slight, the entire outlook is now of a reassuring nature. Some Coal miners are resisting the insignificant reduction which our companies deem necessary, and 650 of them have struck at the Bois de Boussu mine. This movement has, however, remained confined to that locality. No importance should be attached to it.

GERMANY.

(*Borsenhalle*).

HAMBURG, Oct. 9, 1875.—*Metals.*—Business in metals in general has not yet returned to the state of greater animation that prevailed ere the discount rate was enhanced at our principal financial centers. Soon, however, these matters will resume a normal condition, gold already beginning to arrive from the Bank of England. The state of trade, if we except this passing scarcity of gold, is generally much sounder than a year ago. Speculation in metals has greatly subsided since, and what demand there may be is for legitimate consumption. Crops in Germany have been sufficiently abundant, and for any surplus we can spare we can count upon good prices abroad. The general stagnation of industry and commerce is wearing away by degrees, many solid undertakings are planned, and we foresee a period of growing prosperity once more for the coming spring season, which may last the whole of next year, unless the political horizon should become cloudy again, of which there are no signs apparent at the present juncture. *Copper* has been quiet at Stettin at 95 to 100 marks. Here nothing has occurred in it; we quote Dronthelm, 91 marks; Minnesota, 110; and Quincy, 88. *Tin* has relapsed into a state of quietude without change in rates. *Lead.*—Our markets have been, on the whole, inactive. At Stettin Spanish commands 27 marks; German, 23 to 25. Here some larger dealings have taken place in German Lead, on terms not transpired. We quote German, 23·75 to 24·50; English, 26, and Spanish, 26·10. *Spelter* is remarkably firm all over Germany. Stettin quotes 25 to 26; Breslau, W. H., 24·75; medium brands, 23·75 to 24; special, 24. Nothing can be reported as having been done here.

HOLLAND.

(*Koch & Vlierboom*).

ROTTERDAM, Oct. 5, 1875.—*Tin.*—Since the Trading Company's sale on the 28th ultimo, which resulted in an average of 52¾ guilders, the market has been excessively quiet, trade in the metal being in a languishing condition. A couple of hundred slabs Banca have found purchasers at 53, while November delivery has not brought over 52⅝. The demand for consumption is insignificant. Banca, spot, closes at 52¾ to 52⅞, and Billiton at 50 to 51⅛.

AUSTRALIA.

(*Resident.*)

BRISBANE, July 31, 1875.—*Tin.*—The returns of stream Tin forwarded from Murrurundi and Grafton for the first half of 1875 foot up 4087 tons and 25 tons Ingots, against 5764 tons stream Tin for the corresponding period in 1874. We may calculate upon a positive decrease of production for the remaining six months. When telegraphic intelligence reached the mines that Australian Tin had declined at London to £75 per ton, all hands were discharged in one of the leading localities at Stanthorpe and owners of rich ground may also suspend operations in other places. But there will be still a large number of miners who work under licenses, and who have to continue or else abandon Tin washing altogether. Stream Tin has now declined to £86 per ton, without buyers. The total amount of Tin to be shipped from this country to England during the current year, we estimate, will not exceed 6000 tons, but pretty large shipments will be made to China and California instead. There is a good deal of diversity of opinion expressed as regards the extent of Tin deposits in Tasmania; very little doubt prevails, however, as to their general importance.

EAST INDIES.

(*Dummler & Co.*)

BATAVIA, JAVA, Aug. 28, 1875.—*Tin.*—On the 9th instant 9229 piculs Billiton brought an average price of 52·58 guilders per picul. The next sale will take place on the 9th of October, and will consist of about 9000 piculs. *Coal* is in large supply. A cargo of West Hartley was sold at 20 guilders, and one of Australian at 16, since when nothing has been done. *Shipping.*—There has been some inquiry for tonnage since our last, particularly for the United States and Channel, but vessels are coming in very fast, and rates are not very firm at the moment. *Exchange* has declined 1⅛ to ¾ per cent. for Sterling, and 1 to 1⅛ per cent. on Holland. We quote, 6 months' sight on London, 11·70 per pound sterling.

(*Gilfillan, Wood & Co.*)

SINGAPORE, Sept. 3, 1875.—*Tin.*—The demand has been active, owing to the advance in London. It has, however, declined a little from $32·60, the highest point reached, purchases having been made latterly at $32·35 per picul. A fair quantity has changed hands, and a good deal is awaiting shipment for the United States and United Kingdom. There have been shipped from the Straits to the United States during the first eight months of 1875, 36,321 piculs, against 20,355, 22,967, 42,903, 35,257 and 40,692 the previous five years. *Shipping.*—There are more disengaged vessels in harbor than there is employment for, and berth rates for England are weak in consequence. The Kate Carnie is loading for New York. The Nehemiah Gibson has been chartered for Boston. The steamers Orestes and Galley, of Lorne, now loading in China for New York, may call here to fill up. The Glenroy, for New York via London, took 100 piculs Tin. The East Lomond, from Penang for New York, took 1590 piculs. *Exchange* is steady at 4/1⅞, 6 months' sight, London.

(*Aitken, Spence & Co.*)

COLOMBO (Ceylon), Sept. 4, 1875.—*Plumbago.*—No change to report; very scarce and demand moderate. We quote, free on board, without freight, exchange at par, cleaned, including packages, per ton and duty: Lump, 320/; Chip, 180/, and Dust, 120/. Freight to New York, 70/ per ton. Shipments from Ceylon to the United States from Oct. 1, 1874, to Sept. 4, 1875, 29,893 cwts., against 31,410 a year ago; to England, 56,855; to the Continent, 1448; to India, 21; and to Australia, 97. *Shipping.*—The Lelia Alice left for New York on the 31st ultimo with 1110 cwts. of Plumbago on board. Demand is strong for another handy sized ship, but tonnage in search of freight is still exceedingly scarce. *Exchange.*—1/10⅞ to 1/11. P. S.—Sept. 17.—The tone of the market is slightly firmer, owing to the orders from the London and American markets.

(*Clark, Spence & Co.*)

POINT DE GALLE (Ceylon), Sept. 14, 1875.—*Plumbago.*—Very little doing. We quote fine Lumps, £16; Chips, £8 to £9; and Dust, £4 to £5 per ton without export duty, which adds £1 per ton to the cost. *Coal.*—Cheaper supplies are now commencing to arrive, and we quote, free on board steamers, 50/ Newcastle, and 52/6 Cardiff. Australian cargoes have been offered for sale here, but not finding purchasers, were placed at outports; 1300 tons ex Dunbar Castle are still offering. *Exchange*—6 months, sight, London, 1/11 to 1/11⅛.

(*Arnhold, Karberg & Co.*)

CANTON, Sept. 10, 1875.—*Metals.—Lead.*—The only sales reported in this article is a sale of 380 piculs at $7·60 per picul, continued dullness in the demand for consumption and accumulating stocks rendering dealers more cautious than ever. Prices are tending downward, and L. B. would to-day be obtainable at $7·50. *Tin* is weak and difficult to move. *Quicksilver.*—The sudden rise in home values has given speculation a fresh impetus, but toward the close it has subsided. We quote: Spanish, $99 to $100, and California, $100 to $110.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(*From our Regular Correspondent.*)

SHEFFIELD, ENG., Oct. 11, 1875.

ENGLISH DEVELOPERS OF AMERICA.

A local newspaper announced the other day that Mr. Alderman Allott, of Sheffield, with Mr. Titus Salt, Junior, of Saltaire, had sailed in the Germania steamer for the United States, "on business connected with the development of the mineral resources of Tennessee, expecting to be absent about two months." I may say that Mr. Alderman Allott is, for the most part, a "self-made" man, is in business with two partners as a public accountant and financial agent at Sheffield, is a member of the Sheffield Town Council, a member of the Sheffield School Board, and auditor to several large companies—amongst them the Midland Railway Company. Mr. Titus Salt, Junior, is the son of the well known Sir Titus Salt, the renowned alpaca, &c., manufacturer of Saltaire, near Bradford, and has, it is said, recently become much more intimate than formerly with his present traveling companion. Mr. Allott was, or is, an iron works proprietor, and a leading partner in more than one large colliery undertaking, beside which advantages he had aspirations to others *in posse*—notably, as a Member of Parliament for Sheffield. All these, however, have been abandoned, and, if rumor speaks correctly, the sacrifice is pretty nearly altogether due to Tennessee. I do not absolutely vouch for the accuracy of the surmise just embodied, but I have half a dozen good reasons for believing it to be very near the mark. If all I hear be correct, other Sheffield gentlemen have had their fingers in the same pie, and more than one of the number has had to "pay for his whistle"—to use an expressive old idiom. All have not suffered alike, however, but all have, I do not doubt, acquired not a little beneficial experience by the transaction.

EXPORTS DURING SEPTEMBER.

The Board of Trade returns setting forth in tabular form the quantities and values of our exports during the month of September, and for the nine months of the year terminating on the last day of that month, are, on the whole, calculated to inspire the belief that matters in the iron and hardware industries are not growing materially worse. The exports of coal, coke and patent fuel, for instance, are quite up to the average of the same period of last year as to quantity, but in point of the money values in respect of a total of 10,000,000 tons, there is a diminution of nearly £2,000,000 sterling. The hardwares sent out of the kingdom during the month were worth £352,302, as against £400,473 in the corresponding period of 1874, a decrease of £48,000, which, although serious if taken as an isolated fact, is still within the average decrease (£74,000) of the past nine months. The figures for the nine months will be found below. In iron and steel the total for the three quarters of the year is some 40,000 tons in excess of that for the same portions of last year, but the value is £3,500,000 lower, railway iron alone having fallen off to the tune of 200,000 tons.

IRON AND STEEL.

	Eight months ended Aug. 31, 1874. Quantity. Tons.	Value. £	1875. Quantity. Tons.	Value. £
Pig	523,263	2,557,769	711,009	2,641,117
Bar, angle, rod, &c.	178,542	2,191,409	203,447	2,048,064
Railroad	637,995	8,016,922	447,480	4,499,304
Wire	25,077	546,763	30,603	567,251
Armor plates, sheets, &c.	115,796	2,100,839	150,165	2,464,010
Tin plates	90,291	2,757,013	106,769	2,946,707
Cast or wro't.	195,621	3,874,929	185,105	3,358,671
Old for remanufacture	34,327	198,727	14,403	70,481
Steel, unwro't	22,769	888,560	22,455	808,890
Manufactures	6,959	569,945	8,161	614,664
Total	1,850,640	23,702,875	1,879,647	20,019,159

HARDWARE AND CUTLERY.

To	Nine months ended Sept. 30, 1874.	1875.
Russia	83,122	78,360
Germany	200,239	193,683
Holland	82,922	79,806
France	102,819	106,616
Spain and Canaries	78,762	72,502
United States	490,166	445,003
Spanish West India Islands	57,249	99,174
Brazil	193,408	211,591
Argentine Republic	107,731	85,223
British North America	214,559	223,060
British India	230,424	212,266
Australia	452,738	508,880
Other countries	975,783	681,305
Total	3,269,016	3,195,564

COAL, COKE, ETC.

To	Nine months ending 30th Sept., 1874. Quantity. Tons.	Value. £.	1875. Quant'ty. Tons.	Value. £.
Russia	802,412	712,553	758,037	535,090
Sweden and Norway	675,501	580,672	826,448	555,348
Denmark	482,323	396,527	543,569	333,020
Germany	1,544,529	1,258,436	1,634,544	970,135
Holland	333,322	304,322	340,849	231,888

France	1,721,301	1,415,417	2,001,214	1,229,523
Spain and Canaries	438,927	458,724	507,114	406,048
Italy	657,446	604,554	713,505	513,431
Turkey	267,187	244,695	188,969	142,743
Egypt	452,182	438,616	355,751	277,159
Brazil	271,621	238,200	262,315	217,891
Malta	231,021	227,471	153,929	118,207
British India	447,403	416,769	400,512	310,016
Other Countries	1,975,305	1,339,666	2,034,033	1,488,572
Total	10,310,570	9,186,624	10,720,799	7,329,071

MISCELLANEOUS.

	Quantities. 1874.	1875.	Values. 1874. £.	1875. £.
Fire arms (small)	..	..	280,610	457,636
Brass, manufactures of, not heavy ordn'ce, cwt.	82,584	68,890	535,916	371,835
Carriages. Railway carriages for passengers, number	399	439	117,853	111,069
R'lway trucks, wagons, &c., number	1,997	3,137	162,630	256,637
Coal, &c., tons	10,310,570	10,720,799	9,186,624	7,329,071
Copper, unwro't, cwt.	166,901	161,010	733,415	710,902
Copper, wro't.	161,489	173,067	802,761	870,050
Mixed yellow sheathing, cwt.	214,542	208,332	859,663	818,379
Lead—Pig roll'd, &c., (tons)	20,802	27,659	680,479	637,870
Machinery. Steam engines	..	..	2,360,308	2,028,970
Other sorts	..	..	4,909,160	4,920,129
Plate and pl'td & gilt wares.	..	..	181,283	199,315
Teleg'ph wires and apparatus connec'd therewith	..	..	1,718,482	805,464
Tin (unwrot. cwts)	123,917	85,113	660,686	396,514

THE FUTURE.

The *Economist*, in reviewing the figures just given, takes a rather hopeful view of the situation, and thinks that as the decrease of the exports for the month is only 7·5 per cent. for the month and 6·4 per cent. for the nine months, it does not show that the foreign trade is worse than it has lately been. The fact of the decrease the *Economist* thinks is unsatisfactory enough, because this is now the *third* year of depression in values and the *fourth* in quantities; but it is of opinion that the actual extent of the depression should not be exaggerated. In detail, the main facts to be noted are that the articles which show an increase are iron, coal and steel, although it may be remarked by myself, that it is in these articles that the reduction in values is the most conspicuous. In iron and steel the increase in quantity is 4 per cent. and the decline in value 16 per cent., much of the latter, in the opinion of the writer in the *Economist*, being due to the substitution of less valuable for more costly constituents of the total exports. Upon these premises the writer builds up the hope of "better things to come" with some reason, as his arguments are the outcome of a careful analysis.

THE COST OF CABLING

appears to be as subject to frequent changes as the satellites of this terrestrial sphere. As soon as the Direct Cable Company commenced their operations, the Anglo-American Company lowered its charge to 1/ per word, at which tariff it did a good and remunerative business As soon, however, as the "Direct" cable broke, the monopoly was promptly resumed, and the old prohibitive rate of 4/ again became law, as it now is and appears likely to remain. At 4/ per word the number of messages sent over the cable is so few that it is stated that the wires are only occupied for 4 hours daily out of the 24. Monopoly is a great power whilst it endures, but it is extremely provocative of opposition as a rule, and ultimately destroys itself.

THE SCOTCH PIG IRON MARKET

is again weak, the speculative bolstering up operations, alluded to in my last week's letter, having collapsed somewhat ignominously as the settling day approached. As soon as the settlement was fairly got at warrant prices came down, and by the end of the week they were selling at 62/6 per ton for cash. The week's shipments were 10,870 tons, or about 700 tons less than during the corresponding week of 1874. Over 7800 tons were sent into Connal's stores during the six days, making the total quantity held on October 8th 73,529 tons. The number of furnaces in blast now, 116. Last year at this time there were 117. Freights to your ports are now, Glasgow to New York 2/6; Ardrossan to New York, 5/; Glasgow to Boston, 14/; Ardrossan to Boston, 14/; Glasgow to New Orleans, 5/; Ardrossan to New Orleans, 6/; Glasgow or Ardrossan to Baltimore, 8/; to Philadelphia, 10/; and Providence, 14/.

Writing from Glasgow on Oct. 8 (night), Messrs. James Watson & Co. said: "The price of warrants has rapidly declined this week from 68/7½ to 62/6, cash, closing sellers at the latter figure. Shipments last week were 10,870 tons, against 11,562 tons in the corresponding week of 1874."

	No. 1.	No. 3.
G. M. B., at Glasgow	65/	63/6
Gartsherrie, "	75/	66/
Coltness, "	79/	66/6
Summerlee, "	69/	65/6
Langloan, "	76/	66/
Carnbroe, "	68/	65/
Calder, at Port Dundas	76/	65/6
Glengarnock, at Ardrossan	69/6	68/6
Eglinton, "	66/	65/
Dalmellington, "	66/6	65/6
Shotts, at Leith	76/6	67/
Kinnell at Bonness	66/6	64/

Messrs. Wm. Colvin & Co. (Glasgow), Oct. 12th, write: "The warrant market became very weak on Wednesday and Thursday last, and the price fell rapidly to 62/6, cash. Since then an extensive business has been done, without much change in value, the quotations ranging from 61/6 to 63/. To-day a large quantity of iron changed hands from 62/6 to 61/6, closing this afternoon with buyers at 61/6, cash, and sellers at 61/9; for delivery, one month open, the price is about 3d. per ton higher. There has been a general reduction in the prices of makers' iron, and they are still somewhat irregular, as under:

Delivrable alongside.	No. 1.	No. 3.
G. M. B., at Glasgow	64/	62/
Gartsherrie "	73/6	65/
Coltness, "	78/	66/6
Summerlee, "	67/6	65/
Langloan, "	77/	63/
Carnbroe, "	57/	64/
Monkland "	65/	63/
Clyde "	65/	63/
Goven, at Broomielaw	65/	63/
Calder, at Port Dundas	76/	65/
Glengarnock, at Ardrossan	69/	65/
Eglinton, "	64/6	63/6
Dalmellington, "	65/	64/
Carron, at Grangemouth	65/	..
Carron, " specially selected	67/6	..
Shotts, at Leith	76/	65/
Kinnell, at Bo'ness	65/	62/
Bar Iron	£8. 0/ to £8. 10/	
Nail Rods	£9. 0/.	

SHIPMENTS.

	Tons.
Week ending Oct. 9, 1875	11,746
" Oct. 10, 1874	10,307
Increase	1,439
Total Increase for 1875	89,099

Messrs. John E. Swan & Brother's (Limited), prices current, Oct. 8th, says:

Glasgow Brands.	Furnaces B'wing. 116	Furnaces Out 30.	Furnaces Built. 154.	Prices. No. 1.	No. 3.	No. 4
Gartsherrie	13	3	16	75/	65/6	..
Coltness	12	0	12	78/6	67/	..
Summerlee	6	1	8	67/6	64/	64/
Langloan	7	0	3	77/	66/	65/
Govan	4	0	5	65/	63/	65/
Calder	3	1	7	75/	65/	65/
Shotts { Bess'mer	2	0	2	80/	..	..
Shotts { Ordinary	3	1	4	77/	64/	..
Carnbroe	4	2	6	67/6	64/	65/
Wishaw	2	0	3	..	..	..
Monkland	6	0	6	65/	63/	..
Chapelhall	3	0	3	70/	..	..
Clyde	5	0	6	66/	63/6	..
Quarter-Clyde	4	0	4	65/	63/	..

* f. o. b. Glasgow, 1/ per ton, extra.

Glasgow Warrants, 3-5 No. 1, 2-5 No. 3, g. m. b., 62/6.

WEST COAST BRANDS—*f. o. b. At Iro-san.*

Glengarnock		7	2	9	69/6	66/ 65/
Ardeer		4	1	5		
Eglinton	Brand'd	6	2	8	65/	64/ 65/
Lugar	Egl't'n	4	0	4		
Muirkirk		3	0	3		
Portland		3	3	6		
Dalmellington		6	2	8	66/	65/ 60/

EAST COAST BRANDS—*f. o. b. in the Forth.*

Kinneil		3	1	4	66/	62/6 60/
Almond		2	1	3	66/	62/6 60/
Carron	Select'd	4	2	6	67/6	.. ..
Carron	Ordn'y				65/	.. ..
Lochgelly		0	4	4	..	.. ..
Lumphinnans		0	2	2	..	.. ..
Bridgeness		0	2	2	..	.. ..

NORTHERN IRON TRADE.

It is telegraphed to-day from Stockton-on-Tees that the suffering and distress occasioned in the Cleveland district by the depression of the finished iron trade is rapidly increasing. At the extensive North Yorkshire Iron Works, at South Stockton and the Moor Iron Works, at Stockton, the men have received notices terminating their engagements, and at other large establishments the same step is about to be taken. One Stockton ship yard is entirely, and another partially, closed. I should surmise that the works referred to in this telegram are for the most part very largely engaged in the iron rail trade.

TRADES OF SHEFFIELD.

In one or two of the manufacturing departments there is, I think, a slight amelioration of the previously existing dullness, but as yet I am unable to detect any prominent tokens of that "considerable improvement" which is in some quarters reported to have taken place. In the rail mills, for instance, very little work, comparatively speaking, is being done, only about three of the many large local establishments having any orders on hand. In passing through Dronfield yesterday I noticed that the large works of Messrs. Wilson & Cammell were partially well engaged, the output of rails being visible in the contiguous railway sidings to the Midland line. At Sheffield itself one of the largest rail making concerns is working off two or three orders, and there is another establishment in the neighborhood which is doing a little in the same line. With these exceptions the rail trade is almost hopelessly sluggish; so much so, in fact, and with such slight prospects of alteration that firms of such standing as Messrs. Samuel Fox & Co. and others have abandoned rail making for the present.

In other respects, too, trade cannot by any species of reasoning, to take cognizance of facts, be said to be anything like brisk. Many of the local blast furnaces, for instance, are out. I notice that even at a great concern like the Sheepbridge Iron Works only four furnaces are blowing, and a like state of things prevails elsewhere, and it should be borne in mind, too, that the places just named have their own coal, and possess every possible facility for producing iron of all kinds at the very lowest rates.

There is, it is true, a little better inquiry for Bessemer steel in the rough, or partially manufactured condition, at prices varying from £8 to £13. 10/ or £14 per ton, according to the labor and work done to the ingot. Despite this fact, the reduction noted by me last week as having been declared in the price of certain good brands of hematite pig iron is maintained and confirmed. The current rates are as follows: Millom Bessemer, No. 1, 80/; No. 2, 77/6; and No. 3, 75/; ordinary No. 3, 75/; No. 4, 74/; No. 5, 73/; mottled 80/, and white, 75/—on four months' terms, or 2½ off for prompt cash; Maryport hematite No. 3, 70/; No. 4, 70/; No. 5, mottled and white, 70/; Bessemer No. 1, 77/6; No. 2, 75/, and No. 3, 75/ per ton, with 2½ off for cash. Ordinary foundry pig iron is selling with tolerable freedom, and prices are steadily firm in consequence. The agents here of Cleveland firms offer a good No. 3 foundry iron at about 60/ to 62/ per ton delivered, at which figures it is not materially cheaper, quality for quality, than locally produced foundry iron. A few sales of forge qualities are also reported to have taken place during the week, at rates somewhat more in sellers' favor. The cast steel works are only very indifferently engaged. This remark applies to some of the very best houses in the trade, which are now so poorly supplied with orders that the works are wholly laid off on the Saturday and Monday of each week. Such demand as does exist is mainly for best tool steels, plow plates, axe steel, and specially rolled sections for specific purposes. A few sales of spring steel at £16 to £18, and of sheet steel at various rates, are also being made, some of the former on account of Lancashire and Liverpool houses.

At the armor plate shops there is a fairly good amount of work in hand, although I am given to understand that even in these hitherto unvaryingly well employed departments symptoms of slackness are not wanting. Orders are in hand, but there is not that pressure which has often been the characteristic of this class of work. The work in progress of this description is for the Russian, British and other governments. The manufacture of umbrella, &c., wire is, I hear, being relinquished by one of the local iron works. On the whole, however, there is a very respectable call for all kinds of steel wire, which is gradually coming into increased use for many purposes, where ductility, lightness and great strength are sought to be combined—such as for steam plowing tackle, colliery and other winding ropes, and bridge suspension chains, beside many minor appliances.

Foreign irons are in indifferent request here, owing to the depression which has so long existed in the local file trade. At one of the best firms in this branch of industry the work men are now "stinted" to about four days a week, and up to a short time back only two or three days were allowed to be made. Russian irons are consequently not very strong, and in Swedish bars of certain brands a drop of £1 per ton has been declared during the past few days, beside a reduction of £2 in boiler plates of Swedish production.

A serious explosion took place on Tuesday evening at the Elsecar Iron Works, of Messrs. W. H. & Geo. Dawes, by which several men who were cleaning away the front of a blast furnace preparatory to a run, were very badly injured.

A petition for liquidation has been filed in the Sheffield Bankruptcy Court by or on behalf of Mr. Magnus Sanderson, brass founder and chandelier manufacturer, Hallcar Brass Works, Saville street, Sheffield. The liabilites only amount to about £1200.

Another meeting, largely attended, of the shareholders of the Phœnix Bessemer Steel Company, limited, which suspended payment some time back with heavy liabilities, was held on Tuesday afternoon at the Victoria Station Hotel, Sheffield, for the purpose of further considering what offer should be made to the creditors, who had refused 10/ in the pound. After a very long discussion, it was decided that the works ought not to pass out of the hands of the shareholders, and that the committee be authorized to take immediate steps for securing the same, provided the unsecured creditors would accept 12/6 in the pound.

The strike at the Parkgate Iron Works is still unsettled, and is likely to remain so. The men at the Morewood's Colliery, Derbyshire, have resumed work at a reduction in wages of slightly over 10 per cent. after a strike of 13 weeks.

In the coal trade generally there is no very notable alteration to record. House coal is in much better request, but prices are not yet enhanced. Steam and gas coal remain at prices which range from 6/ to 11/ per ton at the pits.

In some of the cutlery departments there is a little more work doing, although a Sheffield paper, which is notorious for its lack of trade information, assures its few readers that matters are hopelessly dull in every branch of business. The Board of Trade returns do not demonstrate that fact, but they do show, as I have endeavored to do week by week, that the hardware industries of Sheffield and Birmingham have been, and are, doing an amount of business in a steadily quiet way on a far better scale than the iron works.

BIRMINGHAM AND STAFFORDSHIRE.

The quarterly meetings are again on the very eve of being held, yet there is nothing to indicate whether any alterations will be made in the quotations for finished iron. The best informed business men, whose opinions have been ascertained, incline to the belief that no reduction can by any possibility be declared, and they base their belief upon the facts that pig iron is very firm in price, that coal is showing symptoms of becoming dearer, and that the wages of the men in the earlier processes of making iron are irrevocably, or nearly so, settled for some months ahead. But, on the other hand, they do not appear to entertain the idea that any substantial official increment will be made at the quarterly meetings, seeing that the demand is not by any means large or pressing, and that some little slackness may not unnaturally be anticipated to ensue upon the very early termination of the shipping season to the northern ports. Balancing matters up then, the probabilities appear to be that here and there a good house may see its way to alter figures 5/ or 10/ per ton, but that there will not be any official declaration in either direction. The iron and hardware industries of "Brum" and Staffordshire are just now steady. The Dudley nail masters will issue a new list of higher prices on October 31st. Bolts and nuts are down considerably. Plane irons of Birmingham are reduced in discount by 5 per cent., and Messrs. Peter Wright & Sons have advanced their vises by one farthing per pound, from the 5th instant.

SOUTH WALES.

It is stated that the management of the great Aberdare and Plymouth iron works will, under the new scheme, be located at Aberdare. Mr. Fothergill will manage. The Plymouth iron works will remain idle until trade improves, but the coal will be got and sold as largely as possible. The furnaces at Abersychan are about to be restarted. At Blaenavon and other of the Monmouthshire works more is being done. Many of the great Glamorganshire establishments are either idle or working for stock. Rails are quoted at £6 to £6. 15/, and £7 per ton for good qualities.

THE METAL MARKETS.

The metal markets opened quiet at the beginning of the week, a very restricted business in copper being done consequent upon the absence of advices as to charters. On Tuesday, 25 tons of Chili bars sold at £82. 10/ and 5 tons of Straits tin at £85. 15/. On Wednesday Straits was £85. 10/ and Australian £83. 10/. On Thursday the telegrams as to charters arrived, and showing only a limited quantity, there was a good business in copper on Friday—Chili bars at £82. 10/ and best at £84, 335 tons so changing hands. In tin, on Friday, 40 tons Straits went off at £84 to £85, various dates.

Messrs. Von Dadelszen & North say: "Copper has been very steady, with a moderate amount of business in Chili bars at £82 and £82. 10/, cash, for ordinary brands. Yesterday, when the charters for the second fortnight of September were telegraphed as only 1500 tons, of which 900 tons for England and 600 tons for France, the price hardened and business was done at £82. 15/ for ordinary brands and £84 for best. Australian is still held from the market. Burra is £98. 10/ to £99, English, both raw and manufactured increasing in value. Tin has been dull, and but very little business done. Straits has sold in small quantities, for consumption, from £86 to £85; and from £85. 10/ to £84 for forward delivery. Australian, from £84 to £83. There is no alteration in the position of Banca and Billiton. English tin quiet. Tin plates in rather better demand. Some large orders are reported to have been booked during the last few days, but prices have not transpired. Common cokes are obtainable at 21/ upward. Lead is, if anything, quieter; good soft English pig obtainable at £23. Spelter with more disposition to sell, but it is difficult to effect sales. Silesian, ordinary brands, from £24. 15/ to £25; outpost parcels, £25 to £25. 5/. *Quicksilver.*—Little business done; prices nominally £14. 10/ to £14. 14/.

The *Mining Journal* remarks: "*Copper.*—The market has been steady, and the tendency toward higher prices. The quantity of Chili offering has not in any way exceeded requirements, and for selected brands buyers have had to pay full rates. The charters just announced are moderate, and therefore likely to produce a beneficial effect upon the future of the market. Regulus has realized 17/, and ore 16/6; Chili bars, g. o. b., command £82. 10/; Lota at the same price; best brands, £84. English descriptions are strong, but manufactured is not in active request, and to effect sales of 4x4 Indian sheets £94 has been submitted to. In yellow metal orders do not come forward very freely, and the enhanced rates check the execution of most indents in merchants' hands. The Indian buyers are not prepared to take yellow metal in large quantities beyond 7¼d. per lb., and it is only for very small orders that 7¾d. will be paid; 7⅞d. and 8d. is consequently much too dear, and sellers must modify their rates to some slight extent. *Lead.*—The transactions have not been of any magnitude, and prices remain unchanged. *Tin.*—This metal has fallen. Straits has receded to £85, and Australian, £82. 10/ and £83. The course of the market is downward, and lower prices will have to be taken to induce buyers to come forward."

Messrs. J. Berger Spence & Co. (London, Manchester, &c.), to-day report: "*Copper.*—Since advice of charters showing only 1500 tons, the market is firmer; but the business transacted has only been limited. The reaction in *Tin*, prior to our last issue, leaves it during the present week dull, with little or no business doing. *Spelter* weaker, and buyers hold off, waiting a reduction that is pretty generally looked for. *Lead* steady at late rates.

Latest Liverpool prices:

Iron; f. o. b. in Liverpool, per ton.

	£	s.	d.	£	s.	d.
Merchant bar	7	17	6 @	8	5	0
Merchant bar, in Wales	7	7	6 @	7	15	0
Staffordshire	8	10	0 @	11	15	0
Hoop	9	15	0 @	10	15	0
Sheet	11	10	0 @	11	15	0
Nail rod	8	10	0 @	9	0	0
Bar, best crown	8	10	0 @	8	15	0
Boiler plates	11	0	0 @	12	0	0

Tin Plates; f. o. b. in Liverpool, per box.

	£	s.	d.	£	s.	d.
Charcoal, I. C.	1	7	0 @	1	10	0
Coke, I. C.	1	2	6 @	1	4	0

Copper: Delivered in Liverpool, per ton.

	£	s.	d.	£	s.	d.
Bolt and Sheathing	93	0	0 @	94	0	0
Tile	88	0	0 @	90	0	0
Tough cake	87	0	0 @	89	0	0
Best selected	90	0	0 @	91	0	0

About Wooden Clocks.

The place where wooden clocks began, at least as an article of any considerable trade value, was in the farm houses in the Black Forest, in Baden and Wurtemburg. There is hardly a hamlet in the civilized world where the Black Forest clock, or one made upon the suggestion of that original, may not be found. And though various improvements have been introduced, perhaps it is safe to say that these improvements are rather in the mechanical facility of construction and in consequent cheapness of manufacture, than in the quality of the article. The modest wages of the Black Foresters, however, still keep down the prices of their work, and for accuracy of timekeeping the best German wooden clocks are unexcelled by any other of the same material. The compensating pendulum', in clocks of metal works, made of different metals, is not the only application of that principle. Different sorts of wood, in the case and in the works, are employed in the better classes of the German wooden clock in order to counteract the influence of the weather. In 1842 it was estimated that two hundred thousand wooden clocks were annually made in the Black Forest region, and thence found their way over Europe and America. At the present time the annual product is about seven hundred thousand.

The beginning of Black Forest clock-making was near the close of the 17th century—about two hundred years ago. A family names Kreutz made a rude clock of wood, with a weight, which they gave or sold to the parish priest. A profitable epidemic broke out among the peasantry, and the farm houses of the district soon had each its wooden clock, the foresters and mountaineers of Germany and Switzerland having been ingenious carvers from time immemorial. Soon the "domestic manufacture" became an article of trade. Hawkers of clocks went forth to vend the new invention, and Schwarzwald, the Black Forest, became a household word through Germany. Its clocks were the last things consulted at night and the first in the morning. Our Yankee friends must surrender the claim to the invention of clock peddlers as well as wooden clocks.

The first cuckoo clock sounded between the years 1730 and 1740, the inventor being one Franz Ketterer, of Schonwald. The cuckoo made enough music for forty years, and then came the notes of the flute clock. About the same time the Black Foresters introduced the pendulum into their clocks. Inventions did not find imitators so rapidly a hundred years ago as they do now. For the question as to who first practically applied the pendulum, had been disputed between the countrymen of Richard Hooke, an English mathematician, and Christian Huygens, a Hollander, for a hundred years before the German wooden clock makers adopted the invention. The cuckoo and flute clocks were the first specimens of what the Germans call *spieluhren*, or "clocks of amusement." The trumpet clock came next. A recent visitor to the Black Forest towns, to whom we are indebted for many of the facts noted here, mentions several specimens of the "clocks of amusement." Bands playing or seeming to play, helmeted trumpeters, cuckoos and thrushes, venerable monks who pull the bell and ring the hour, and all sorts of automata, fitted to all purses and all tastes, are shown in the trades halls. Clocks of straw illustrate the delicacy of manipulation, but are not warranted. Most of our readers have seen fine specimens of every variety, the home-bringing of travelers, or importations of fancy dealers.

It is proper to say that the work is not now all done by hand, as in the peasants' cots in the beginning. Machinery is now employed, and the work is transferred from the households of the workers to shops, where they work as journeymen. Still the finer carving must be done by hand, and is more than a mere mechanical occupation. The first noteworthy thing in this subject is the humble beginning of the business in the occupation of the leisure hours of a family. The next is the great extent to which the trade has grown. And, best of all, is the present condition of these thrifty and still not jealous workers. A "clock makers' school," originating with the trade, and encouraged by the government, was opened at Furtwangen in 1850—the first probably of all "technical" schools in the world. The instruction is free, the conditions of admission being only that the pupil must be fourteen years of age, and have passed throug the public elementary free course. The clock makers' school has two main oujects. The first is the instruction of the pupils by theoretical teaching in the elements on which the art of clock making is based. These include drawing, free hand, ornamental, lineal and constructive; arithmetic, geometry, mechanics, natural science and the leading subjects of German industry and mercantile business.

Such is the education for working mechanics thought necessary by practical men. To this course of "book learning" is added a practical school. This is a workshop where the details of the trade are carried on. For admission to this each pupil must bring his own tools. Certainly such an institution, supported by the trade, is a trade union of exceptionally generous character, and the course of study in the school proper may remind all men of all trades that there is a "literature" attached to their callings with which it is of vast advantage to be familiar.—*Philadelphia Ledger.*

Explosion of an Upright Boiler in an Iron Works.—The *Locomotive*, published by the Hartford Steam Boiler Inspection and Insurance Company, describes a recent boiler explosion in an iron works as follows: "This boiler was not unlike the boilers used in many iron works in this country. It was upright, supported on iron columns and had a single large flue, which gradually tapered as it ascended upward. When near the top it enlarged again, and continued of uniform size to the top. This boiler was heated by the gases from the reverberating furnaces. We have known instances where this form of boiler has given trouble by the collapsing of the large flue. If the water gets low, the upper part of the flue is liable to become overheated. To obviate this trouble, we have recommended in many cases three flues instead of one, and the result has been very satisfactory. Soon after the explosion of the boiler under consideration, Chief Inspector Fairbairn, of our Northeastern General Agency, visited the locality and reported as follows: "I found the above boiler to be badly grooved or channeled to a thickness varying from one-eighth to one-sixteenth of an inch, running parallel with and close to the edge of the plates or lap of the longitudinal seams. It was at this point that the rupture took place. It was caused mainly by the corrosive action of the water (it being impregnated with salt), which, together with the buckling or fretting of the plates at that line, caused the explosion. The buckling was caused by unequal expansion, and is also due in some measure to the cross bending action, produced by the internal varying pressure tending to force the plates into a perfect cylindrical form. The boiler was about seven years old, and had not been inspected since it was first placed in the mill."

The Eagle Washer.—Contrary to the practice generally adopted by inventors and manufacturers in placing new goods upon the market, it is not claimed for the Eagle washer that it has any new principle involved in its construction, but professes simply that it operates successfully by employing the old method of saturating the clothes in hot suds and squeezing them rapidly between rollers and a revolving cylinder, which operation produces a result similar to that of rubbing by hand. Being very easily operated, and performing its work quickly and at the same time in a thorough manner, beside being capable of adjustment to any wash tub, and occupying but little more space than a common clothes wringer, it cannot fail in finding favor with house wives who wish to have their work made lighter. In the manufacture of this washer, no pains have been spared to render its mechanical construction as perfect as possible, and its manufacturers, Messrs. Oakley & Keating, 40 Cortlandt street, New York, intend and confidently expect that it will be sold by the trade the same as a ordinary clothes wringer.

The Chatasauqua, Pa., *Dispatch* of the 23d says: The rolling mill at Allentown is now running double time on the company's offer of wages, much to the joy of the Allentown business men, who have suffered greatly by the long stoppage. Arrangements are being made to start the large mill. Notwithstanding predictions to the contrary, the iron turned out is pronounced excellent, and the company are in every way pleased with the new hands. The mill at this place is still idle, the clerks have accepted situations as telegraph operators at different points, and we are officially informed that the company have determined not to resume operations until they can do so at a price that will at least cover the cost of production. Bar iron is now sold by the Philadelphia mills at $56 per ton, just one-half the price it sold at in October, 1872. At present prices, mill owners claim they cannot save themselves from loss; consequently we hear of stoppages and threatened stoppages of mills from all parts of the country. The workmen formerly employed by the Catasauqua Company are leaving the place, having apparently lost all hope of the mill starting this winter. Empty houses are plenty, and dullness reigns supreme.

The causes at work for the destruction of boilers are not always well understood, and the results which follow their operation are sometimes of a startling character. The Washington *Republican* cites the following instance, which occurred recently on the Mount Vernon steamer "Arrow:" "The engineer, on arriving from Mount Vernon, informed the captain that there was a slight leak in the boiler, arising from defective bolt heads. The captain promptly determined to have them replaced at once, and accordingly the boiler was 'blown off,' new bolts obtained and fitted in their proper places. Everything was pronounced safe, and the order was about to be given to pump up again, when 'crack' came an unmistakable metallic sound, which denoted more trouble. A short search developed the fact that a plate had broken nearly across its face. It was a clean, new fracture, without any flaw, and no discoverable reason for its occurrence. The plate had been in constant use for two years, and was made of the best material, and rolled especially for this boiler by order of the captain."

The Crane Iron Company are engaged in casting very large pipes for hot-blast ovens, which will weigh between 2 and 3 tons each. A railway is being constructed, upon which they can be readily removed from the foundry.

The Supreme Court of Iowa has affirmed the constitutionality of the law providing that railroad companies shall be responsible for fires caused by sparks from their engines.

The Origin of Steam Railroads in England.

(Concluded.)

THE FIRST WAGONS AND PERMANENT WAY.

It was never intended, at the outset of the Stockton & Darlington Railway, that it should be other than a tramway designed for the purpose of carrying coals and other merchandise from the interior of South Durham to the seaboard and the intermediate centers of population. At that time, indeed, the South Durham coal field, which now sends out its 18,000,000 tons of coal per annum, was completely isolated from the rest of the world, and the produce, as a whole, was considerably under a million tons. It was at first a moot point whether a canal should not be constructed in preference to a railway, but it was eventually decided that the latter should be adopted, the estimated cost of the canal being £205,283, as compared with £125,000 for the railway. The first work of constructing a public railway was not easy. Not many men then living could have carried it out as Stephenson did. He had more experience of railways than any other man in the North of England, and he had just completed the Hetton Colliery Railway, in 1822. In the construction of the line he adopted the following principles:

"1. On the level, or nearly level, gradients, horses or locomotive engines were proposed to be used, it being laid down as a rule that, if practicable, the gradients, ascending with the load, should not be more than 1 in 100.

"2. In gradients descending with the load, when more than 1 in 30, the use of self-acting planes; and—

"3. In ascending gradients with the load, where the gradients did not admit of the use of horses or locomotive engines, fixed engines and ropes should be adopted."

In the application of these rules to the Stockton and Darlington Railway, Stephenson employed a fixed engine on the line to pull the coals over Brusselton Hill, a steep elevation above Shildon, where, on his advice, two 30 horse-power engines, acting on one shaft, were erected by R. Stephenson & Co., of Newcastle, for drawing the wagons up the incline. The cost of these engines was £3482. 15/. At the Etherly Hill top, two other engines were erected, each of 15 horse-power and acting on one shaft, at a cost of £1982. 15/. The contract for the construction of these engines provided that the builders "should find every description of material, and all fitting up for both engines and boilers, except that the company shall find all the stones in the rough state that may be wanted for the said purpose at Brusselton or Etherley quarries, we leading the said stones—the two boilers for the first named engine to be 8 ft. diameter by 20 ft. long, and the boiler for the Etherley engine to be of the same dimensions, and to be made of the best scrap iron. * * * The size of the working cylinders to be 30 in. for the Brusselton engine and 22 in. for the Etherley engine, and all other materials to be in proportion, and of the best quality and workmanship, fitted up in a complete and workmanlike manner."

One of the greatest difficulties that occurred to the directors of the Stockton & Darlington Railway arose out of the consideration of the wagons that ought to be allowed to run on the line. They were met by all kinds of applications for leave to use wagons, carts, lorries, and conveyances of different sorts and sizes. Confusion and disorder were certain in the long run to arise out of such a miscellaneous and unmethodical arrangement, and hence the company laid down the following conditions for the construction of wagons to be used on the line: That the soles, if of English oak, should be 7 in. by 5 in.; that the bottom sheaths, if of English oak, should be four in number, two of them measuring 9 in. by 4 in., and the other two 6 in. by 4 in., an inch more in each sheath being required if made of other timber; that the hight from the top of the rail to the under side of the cleat, or lining, affixed to the bottom side of the sole ends, should not exceed 1 ft. 7 in.; that the hight from the top of the rail to the bottom should not exceed 1 ft. 8 in.; that the coupling chains should be made of 1 in. round iron, and that protecting or side chains be fixed to the wagons; that the end link should be 3½ in. long, and the rest of the links 2½ in. long; that the bottom part should be 3½ in. broad and 1⅛ in. thick to the first bolt hole in the sheath; that the pin hole should be 1¼ in. in diameter, and 1½ in. from the end of the bar; that the coupling chain pin should be 5¾ in. long from the shoulder, 1⅛ in. thick at the shoulder, and 1¼ in. thick at the point; that the drawing strap and crook should be made of 1 in. round iron; that the journals and axles should be not less than 3 in. in diameter; that the wheels should not be less diameter than 2 ft. 6 in., nor to exceed 2 ft. 10 in., exclusive of the flange; that the weight of the wheels when finished should be not less than 2¼ cwt., nor to exceed 2¾ cwt.; that the brake handles be of 1¼ in. round iron; that the bottom bands be 1⅝ in. square; and that the whole of the iron work specified should be made of best scrap bars. A penalty was attached to bringing any wagon on the line not constructed in accordance with these requirements. All wagons used on the line, and indeed on all lines in the North of England for many years subsequent to this date, were called chaldron wagons, and carried from 2 to 3 tons. Of these there are still over 7000 in use on the Darlington section.

RAILS.

Another matter that greatly perplexed the directors of the Stockton and Darlington line in 1822 was the kind of rails that should be adopted. Stephenson recommended malleable iron rails, 28 lb. per yard, "fish bellied," and Birkenshaw's patent, and the directors, after consulting several other engineers, recommended that two thirds of the line should be laid with malleable iron and the remainder with cast iron, the chairs in both cases to be of cast iron. The following are the conditions which the company issued for their supply:

"1. The proposals to specify the lowest price, as there will not be an opportunity of making any abatement.

"2. No tender will be considered unless made by the principal or accredited agent, nor should it differ in any respect from these conditions and specifications.

"3. The party contracting for malleable or cast iron rails should give a bond in the penalty of £4000 for the fulfillment of his contract, according to specifications.

"4. The party contracting for chairs to give a bond in a penalty of £500 for the fulfillment of his contract according to specifications.

"5. The rails of malleable iron to be made from scraps or good English bars remanufactured—the railway company to have the liberty of sending an occasional inspector to see that the rails and chairs are made of materials according to agreement.

"6. The rails, whether malleable or cast iron, and the chairs for the same, to be tested as laid down, by a weight of 14 tons, placed on a four-wheeled carriage, coupled at a distance of 4 feet, and moving at the rate of two and a half miles per hour.

"7. All rails, of either description, and all chairs, which shall be broken on testing by the above weight, or which at any time within three years after being laid down, shall have any apparent deficiency, shall be returned to the contractor, who shall bear the expenses of all carriage, and supply others to the railway company free from any charge.

"8. The engineer employed by the railway company shall, at their expense, lay down 100 yards of malleable iron rails, and 100 yards of cast iron rails to prove that the specific weight of the rails is sufficient to bear the above described weight."

It was specified that the malleable iron rails should be 56 lb. per double yard; that the breadth of top of rail should be 2¼ in., and the depth at the end 2 in.; that the depth at the middle should be 3¼ in.; that the depth of the top flange should be ¾ in.; that the thickness of the web at the top should be ¾ in.; that the thickness of the web at the bottom should be ½ in.; that the edge should be rounded and the surface flat; that the rails should be perfectly straight, and fit to the chairs accurately, and that a sample rail and chair, or patterns thereof, should be furnished to the company. With reference to the cast iron rails it was provided that the length of each should be 4 ft., and that the weight per double yard should be 115 lbs.—the breadth at the top of the rail to be 2½ in.; the depth at the end to be 4 in.; the depth at the middle to be 6 in.; the depth of the top flange to be an inch, and the thickness of the web at the top to be ⅝ in. The cast iron chairs for the malleable iron rails were required to be 12 lbs. per double yard, each chair weighing 6 lbs.; and for the cast iron rails the chairs were required to be 10 lbs. each or 15 lbs. per double yard.

It is utterly impossible to contemplate the remarkable difficulties with which the pioneers of the first public railway had to contend without feeling that much greater credit is due to their efforts than posterity, in all probability, will ever be disposed to allow. Everything about the Stockton and Darlington Railway was more or less experimental. The directors resolved by an admixture of cast and malleable iron rails, to decide for themselves, by the lessons of experience, which was the most economical. But this was not all. They were quite at a loss to discover how the rails were to be attached to the way. Sleepers such as those now universally used were then altogether unknown. In one or two tramways in Wales and elsewhere oak blocks had been laid down. But the directors seemed to think that stone blocks would be more durable and more firm than timber, and hence they determined to lay the greater part of the line with them. These blocks were obtained from Brusselton quarries, near to the Brusselton Bank incline; and it is a somewhat curious fact that the line was taken further south than it otherwise would have been, in order that it might be brought as near as possible to these quarries, and thus cheapen the cost of the blocks. These blocks cost 3/6 each in wagons at the quarries, or about 9/6 per lineal yard, when drilled and laid down. They were 18 in. to 24 in. long by 14 in. to 18 in. broad, and 10 in. to 12 in. deep, "the top and bottom of each block to be parallel with each other." Into one of the parallel sides of the stone block, and exactly in the center, the contractor was required to insert the cast iron chair to the depth of half an inch. Two holes, each three-quarters of an inch in depth, were drilled through each block to correspond with those of the chair. The oak blocks used in the construction of the original Stockton and Darlington line in 1822-23 were 2 ft. 6 in. long, 6 in. broad, and 6 in. to 8 in. deep. The first switches used on the line were 4 ft. in length and made of cast iron, with wrought iron tongues. The cost of maintenance in the earlier years of the Stockton and Darlington Railway was terrific. Owing to the extreme rigidity of the stone blocks, the rolling stock was nearly shaken to pieces, and the permanent way was much damaged—so much so, indeed, that neither could stand one-half of the wear and tear they now endure under more favorable conditions. Nor was this a feature confined to the first public railway. It applied quite as much to the line from Darlington to York and the Grand Junction and London and Birmingham lines, on each of which stone blocks were at first employed, although they soon came to be superseded by the modern sleeper.

STATISTICAL ASPECTS OF THE STOCKTON AND DARLINGTON RAILWAY.

To the question, "Whether are the statistical or the historical aspects of the railway system the more wonderful," it would be difficult to return a satisfactory reply. Modest enough estimates were formed concerning the probable revenue of the Stockton and Darlington Railway when it was projected in 1818. From coal an annual revenue of £11,904. 19/ was calculated on; from lime, £104. 3/; and from merchandise, &c., £4000, making altogether a total of £16,009. But in the company's second financial year they reached a total income of £18,304, of which £14,455 was from coals. Five years later the total quantity of coal passing over the line reached 424,574 tons, and the receipts from coal traffic amounted to £57,819. In 1860 the coal and coke traffic had advanced to 2,045,596 tons, and ironstone—of which not a single ton had been carried by the company up to 1845—had risen to 1,484,409 tons, the revenue of the year from minerals alone being £280,375. Ten years later still the quantity of coal carried over the line reached 4,341,631 tons, and the quantity of ironstone had exceeded 3,000,000 tons, while the revenue of the company was over a million sterling. All this, of course, was largely the result of the development of the Cleveland iron trade, which may be said to have commenced in 1850. As a further proof of the remarkable progress of the Stockton and Darlington Railway Company, we may remark that the dividends have reached a higher point than those of any railway in the kingdom.—*Engineering.*

Plastic Paper.

A writer in the Boston *Commercial Bulletin*, discussing the increasing industrial uses of paper, says:

Few people are aware of the extent to which papier-mache is used. With the exception of such fancy articles as trays, snuff-boxes, cigar-cases, portfolios and the like, it is not generally supposed that the material is of much practical utility. But, for many years, papier-mache has been made into moldings, cornices, center-flowers and similar decorations for theaters, saloons and other buildings, public and private; not only in this country, but in Europe. The rich ceiling of the British House of Lords, for example, is of this material.

The most remarkable instance, however, of the employment of papier-mache for architectural purposes is in the construction of a church in Norway capable of holding a thousand persons. The interior walls as well as the exterior Corinthian columns are covered with papier-mache. The roof, the ceiling, the statues which adorn the church and even the base-reliefs outside, are of papier-mache, which was made water-proof and nearly fire-proof by an application of vitriol water and lime slaked with whey and white of eggs.

Quite a number of our own public buildings are decorated with papier-mache, and what seems massive and heavy capitals and rich stucco is only dry paper pulp. No doubt such work would excite the ire of John Ruskin, who must have no sham or imitations within his jurisdiction; but one would think even his feelings might be calmed by the assurance that this elaborate and graceful ornamentation is at least as durable as the building which it adorns.

This manufacture is by no means a modern invention, having been carried on for at least a century in France and Germany. The first use made of it was for such articles as snuff-boxes; but the fact that it could be worked into picture frames and moldings soon became known, and, from its lightness, cheapness and great durability, it quickly got in use for house decoration.

Of late years France and Germany have all but entirely failed in doing anything in this branch of industry, the greater portion of the papier-mache manufacture being carried on in Birmingham. Very lately a patent has been taken out in that city for the making in this material of panels for carriages and other vehicles, chimney pieces, etc.

One important feature in the manufacture of these articles is the japanning. When molded, the article is dipped into linseed oil and tar. It is then heated and varnished, after which operations the hand of the artist comes in, and frequently pearl shell and gem inlaying. The pearl is introduced when the lampblack and tar varnish are used. In this way some of the most beautiful and artistic designs are executed. Shortly after the manufacture was introduced into Birmingham, trays were adorned with some of the finest pictures and designs of the masters, and such articles frequently brought many hundred times their original cost of production, so much were they esteemed by rich connoisseurs.

The manufacture of papier-mache has been for many years carried on in Boston; but it is chiefly confined to the production of moldings, cornices and other articles necessary in house decoration. One of the great objections against stucco and plaster cornices and moldings is their liability, if not certainty, of cracking. The slightest "settling" of a house is sure to make unsightly fissures. It not unfrequently happens that even more serious consequences have resulted from this cause; pieces of molding have fallen from the ceiling of buildings upon the heads of people beneath, much to their alarm and injury. With the papier-mache all this is most effectually obviated, it being so light, tough and pliant, that nothing short of an earthquake can possibly displace it, when once properly attached to the walls.

Among the more prominent advantages of papier-mache is that moldings or any other article made of it, may be packed and transported to any port of the world, without the slightest danger of breaking, and, being light, the freight is not expensive. So that a person at a distance wanting such decorations for his house may have them sent, and any carpenter can put them in place, as they can be sawed, planed, bored and nailed wherever desired.

To give some idea of the cost of papier-mache work, we may state that center-flowers from about two feet in diameter to oval ones five or six feet by four cost from three to twelve dollars. Moldings are worth from five to fifty cents, according to depth; and other articles are in like proportion. Any design may be copied, of course, at a greater expense.

There are two methods of making papier-mache: One is by gluing sheets of paper together and then submitting them to great pressure till they have the appearance of one stout sheet; another is by grinding up old paper into pulp, and mixing the mass with gum-arabic, glue, plaster, &c., according to the uses to which it is to be applied. The primitive mode of preparing the pulp was by braying the material in a mortar; but the grinding process has for many years been adopted. Indeed, now manufacturers of papier-mache generally procure the pulp from the paper mills.

The most expensive and difficult part of the work is making the molds. The designs are first carved on wood, and the matrix, or mold, is made by placing this carving in a frame and pouring in molten zinc, similar to the manner in which type are cast.

Lately an improvement has been made by applying the electro-plate processes, thereby procuring thin molds of copper, which are less expensive than the zinc molds, and do no injury to the fine lines of the carving.

When the molds and counter-molds are made the rest of the operation is comparatively simple. The soft, plastic material is turned out like pats of butter. The articles are then placed in a heated closet to dry, and, in a few hours, are ready for use.

In addition to moldings and the like, the plinths and capitals of pillars are among the manufactures; these are made of any size or style of architecture, and are as durable as marble or iron. For the fitting up of passenger ships or steamers this material is extensively used, and is much superior to anything else for the purpose. Such elaborate decorations as spread eagles are also made of papier-mache, and we have seen them of large dimensions, and yet so light as to be easily taken anywhere, and so tough that a fall from almost any hight will not fracture them.

United States Hardwares in Australia.—We have, from time to time, drawn attention to the success with which hardwares manufactured in the United States have competed with some of the British firms in certain foreign markets hitherto supplied almost exclusively from this side, at the same time that United States products have been finding their way into our own country. The reports to hand from the different hardware districts still show that there is little or no revival in the demand for iron and hardware products required in Canada. Thither it is well known the United States manufacturers continue to send the goods they make at rates much under those wanted by the English manufacturers. But this is not all. Some of the manufactured goods sent across the Lakes into the Dominion are said to be more handy than the English patterns. Some time ago we reported that the United States iron and hardware manufacturers were pushing their advantage in Australia and in New Zealand. In those markets, likewise, American enterprise is still disagreeably apparent. The worst of it is that not a few of the American goods are declared, as to quality, to surpass our own. As to the Antipodean markets, all that we have here said is borne out by a communication which has been received by a firm of Birmingham merchants from their agent in Melbourne. He writes as follows: "You will notice our indent runs more on American ironmongery than formerly. Their goods are far superior to English made, and latterly they have been much cheaper. There is no comparison in the profits they pay us, and they give universal satisfaction. Small wares, locks, tools, &c., indeed, all sorts of American made goods, are now being sold in the market; and when once used, seen, or sold, the user or buyer will never again look at English-made articles of the same class."—*Ironmonger.*

The Herreshoff Safety Coil Boiler.—At Bristol, R. I., we recently visited one of the experimental yachts belonging to Mr. Herreshoff, the inventor of this boiler, and who is well known throughout the country as one of the most successful builders of pleasure yachts. This boiler is intended especially for steam yachts, and it is claimed for it that the same grate surface will produce, with about one-fourth the weight, double the power of the ordinary flue boiler. The boiler in operation at this time was 42 inches in diameter by 6 feet in hight, with a grate 27 inches, the whole weight of the boiler complete being 450 pounds. This boiler, Mr. Herreshoff claims, will furnish 25 horse-power, and will enable the yacht to run two miles per hour faster than any other vessel of the same size.

London Metal Market.

(From The Mining Journal.)

	£.	s.	d.	£.	s.	d.
Copper—₩ ton.						
Best Selected	91	0	0	92	0	0
Tough Cake & Tile	89	0	0	90		
Sheathing and Sheets	95	0	0	96		
Bolts	97	0	0	98	0	0
Bottoms	98	0	0	99	0	0
Old	80	0	0		0	0
Australian, Wallaroo	92	10	0	93	10	0
" other brands	92	10	0	90	—	
Chil bars, g. o b.	82	10	0	83	10	0
Wire ₩ D.	0	0	11¾		—	
Tubes "	0	1	0¾		—	
Brass—₩ D.						
Sheets	0	0	9	0	0	10
Wire	0	0	9¾	0	0	0
Tubes	0	0	9¾	0	0	11¾
Yellow Metal Sheathing	0	0	7¾	0	0	8¾
Sheets	0	0	7¾	0	0	8
Spelter—₩ ton.						
Foreign on the spot	24	15	0	25	0	
" to arrive	25	0	0			
Zinc—₩ ton.						
In Sheets	31	0	0	—	0	
Quicksilver—₩ bottle.	14	10	0	14	14	0
Tin—₩ ton.						
English Blocks	90	0	0	0	0	0
Ditto Bars (in bris.)	91	0	0	0	0	0
Ditto Refined	92	0	0	0	0	0
Banca	91	0	0	0	—	0
Straits	85	0	0	—	0	0
Australian	82	19	0	83	10	0
*** Tin Plates—† ₩ box.**						
IC Charcoal 1 qual.	1	10	6	1	11	0
IX " 1 qual.	1	16	0	1	17	0
IC " 2 qual.	1	5	6	1	6	0
IX " 2 qual.	1	11	6	1	14	0
IC Coke	1	1	0	1	3	0
IX "	1	7	0	1	9	0
Canada Plates ₩ ton.	14	10	0	15	0	0
" at works	14	0	0	15	0	0
Iron—₩ ton.						
Bars Welsh, in London	7	15	0	8	—	0
" to arrive	7	17	6	8	0	0
Nail Rods	8	5	0	9	10	0
Nail Rods, Staff'd in L'ndon	8	15	0	9	10	0
Bars	9	7	6	9	10	0
Hoops	10	5	0	10	10	0
Bars at Works	8	10	0	9	5	0
Hoops ditto	9	5	0	11	0	0
Sheets, single, and plates	11	15	0	12	10	0
Pig, No. 1, in Wales	5	0	0	6	10	0
Refined metal ditto	7	0	0	8	0	0
Bars, common ditto	7	0	0	7	10	0
Do, merchant, Tyne or Tees	7	17	6	8	0	0
Ditto, Railway, in Wales	6	10	0	7	0	0
Ditto, Swedish, in London	14	10	0	15	0	0
To arrive	14	10	0	—	0	0
Pig, No. 1, in Clyde	3	0	0	3	5	0
Ditto, f.o.b., Tyne or Tees	2	15	0	3	0	0
Ditto, Nos. 3, 4, f.o.b.	2	13	0	2	18	0
Railway Chairs	4	0	0	4	10	0
" Spikes	12	0	0	13	0	0
Swedish boiler plates	25	0	0	35	0	0
" sheets and strips	28	0	0	29	0	0
Indian Ch'coal Pigs in L'don		0	0		0	0
Steel—₩ ton.						
Swedish, in kegs (rolled)	*	—			—	
Ditto (hammered)	19	0	0	0	0	0
Ditto, in faggots	20	0	0			
English, spring	18	0	0	22	0	0
Lead—₩ ton						
English Pig, common	23	0	0	24	5	0
Ditto, LB	23	5	0		0	
Ditto, WF	24	0	0	0	0	
Ditto, Sheet	24	10	0		0	0
Ditto, Red Lead	25	0	0	—	0	0
Ditto, White	30	0	0	32	0	0
Ditto, Patent Shot	26	10	0	27	—	
Spanish	22	10	0	22	15	0

* At the works, 1s. to 1s. 6d. per ton less. Terne plates 2s. per box below tin plates of similar brands.
† Add 6s. for each X.

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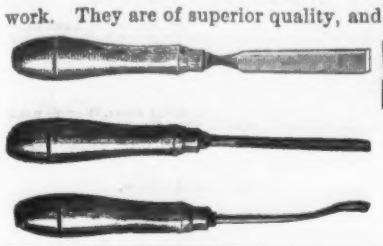
The list price of Rosewood Frames is $1·25 each, and of Birch $1·00 each, with the same discount that we make on our Barber Bit Braces. Price of Saw Blades, $1·20 per gross net.

We also make sets of

CARVING TOOLS.

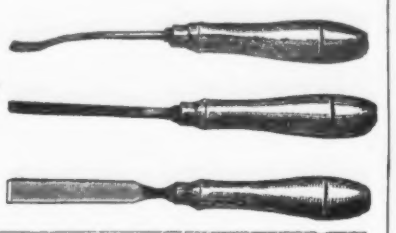
Price of the three tools in nice paper box $1·00, discount 25 and 10 per cent. to the trade. These tools are sharpened and fitted for work. They are of superior quality, and sold at a lower price than imported tools.



Millers Falls Co.,

No. 78 Beekman Street,

NEW YORK.



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(ESTABLISHED) 1843.

These Anvils are manufactured at the oldest Anvil Factory in this country They are *superior* to the best English, or other Anvils, on account of the peculiar process of their manufacture (invented and used only by this concern), and from the quality of the materials employed.

The best English Anvils, after a time, become hollowing on the face by continued hammering in use, on account of the fibrous nature of the wrought iron—causing it to "settle" under the face.

The body of the Eagle Anvils being of crystallized iron, no such settling can ever occur; and the steel face, therefore, remains perfectly true. Also, it has the great advantage that being of a more *solid* material, and consequently with less rebound, the piece being forged receives the full effect of the hammer, instead of a part of it being wasted by the rebound, as with a wrought iron anvil. An equal amount of work can, therefore, be done on this Anvil with a *hammer one-fifth lighter* than that required when using a wrought iron anvil which is more elastic.

The working surface is in *one piece* of JESSUP'S BEST TOOL CAST STEEL, which, after being accurately ground, is hardened and given the proper temper for the heaviest work. The *horn* is covered with and its extremity made *entirely of steel.* The body of the Anvil is of the strongest grade of American iron, to which the cast steel face is *warranted to be thoroughly welded and not to come off.*

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Weighing about	10 lb.	15 lb.	20 lb.	30 lb.	40 lb.	50 lb.	60 lb.	70 lb.	80 lb.	90 lb.
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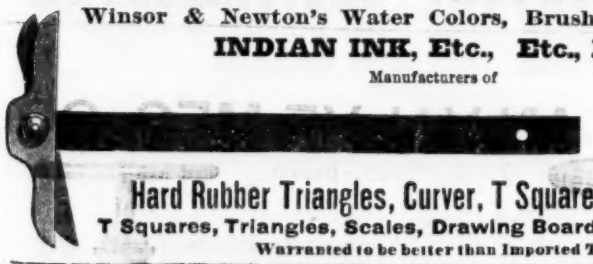

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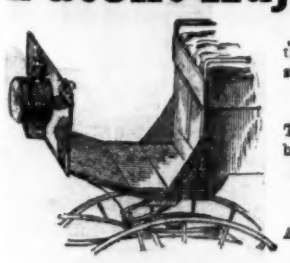

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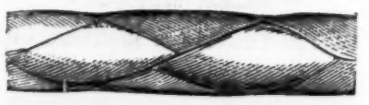

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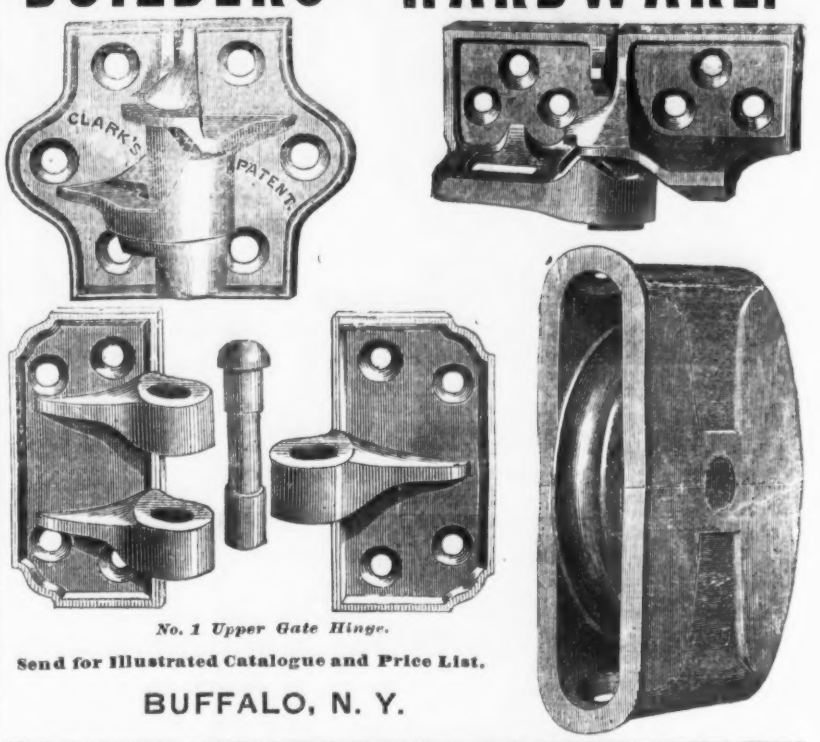

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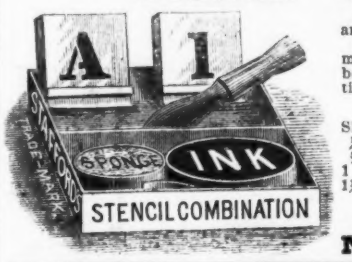

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For marking boxes, barrels, bags, and packages for shipment. Printing all manner of showcards, notices, signs, numbers, prices, &c., and other purposes too numerous to mention. Instructive and amusing for boys.

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Size.		Size.	
½ in., per dozen	$6·00	1½ in., per dozen	$10·00
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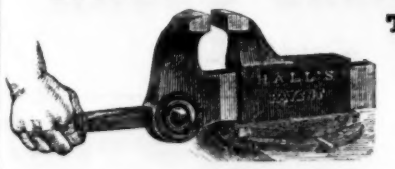

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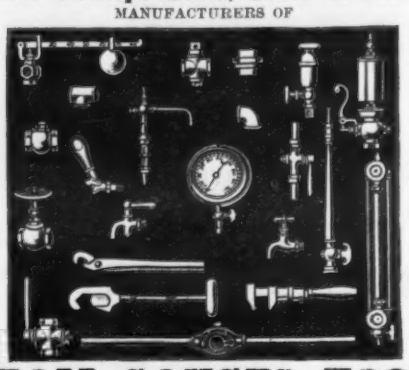

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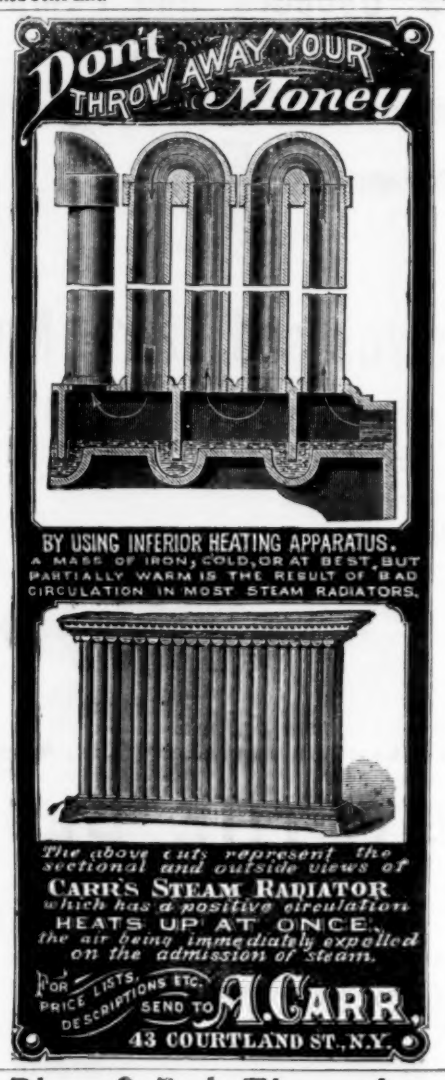

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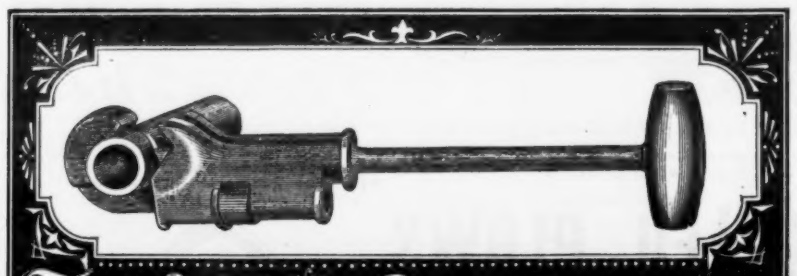

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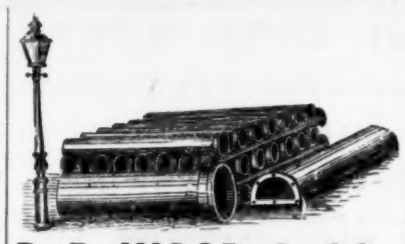

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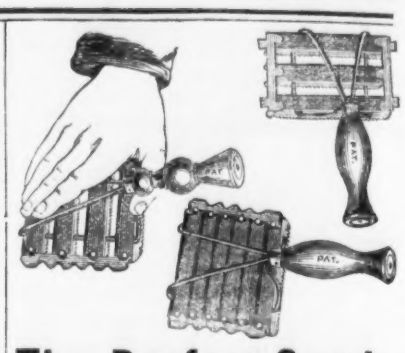

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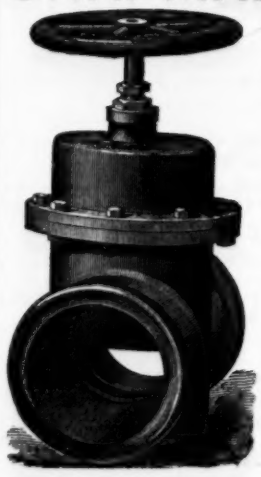

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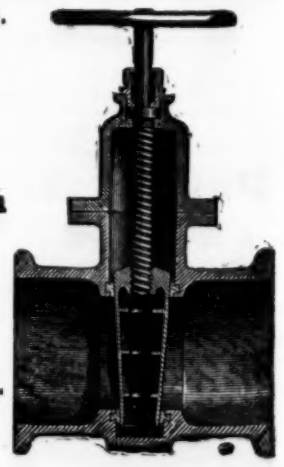

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Providence Tool Co., Providence, R. I. ... 13
Schweitzer Mfg. Co., 57 Reade, N. Y. ... 27
The Hull & Belden Co., Danbury, Conn. ... 33
Phelan Edward, 113 Chambers, N. Y. ... 6
Union Mfg. Co. 99 Chambers, N. Y. ... 7
Van Wagoner & Williams 82 Beekman, N. Y. ... 40
Wilson Mfg. Co., 37 Chambers, N. Y. ... 24
Hardware Specialties.
Bvington & Northup Rochelle, Ills. ... 12
Carpenter, J. M., Pawtucket, R. I. ... 12
Gem Soldering Iron Co. 127 North 9th, Phila. ... 25
Grant & Co., Newark, N. J. ... 13
Langdon Mitre Box Co., Millers Falls, Mass. ... 28
Post C. C., Burlington, Vt. ... 25
Shepard Sidney & Co., Buffalo, N. Y. ... 31
Hay Knives, *Makers of.*
Holt, Hiram & Co., East Wilton, Franklin Co., Me. ... 18
Hoes, *Maker of.*
Hicks O. H. & Co., Baltimore, Md. ... 6
Hoisting Engines. *Makers of.*
Crane Bros. Mfg. Co., Chicago, Ill. ... 9
Otis Bros. & Co. 348 Broadway, N. Y. ... 9
Horse Hay Forks and Fixtures, *Makers of.*
Nellis A. J. & Co., Pittsburgh, Pa. ... 40
Horse Nails, *Makers of.*
Ausable Horse Nail Co. 35 Chambers, N. Y. ... 10
Globe Nail Co., Boston, Mass. ... 10
Pratt & Co., Buffalo, N. Y. ... 31
Putnam S. S. & Co., Neponset, Mass. ... 8
Horse Shoes, *Makers of.*
Burden Iron Works, Troy, N. Y. ... 4
Rhode Island Horse Shoe Co., Providence, R. I. ... 7
Schoenberger & Co., Pittsburgh, Pa. ... 4
Semple, Birge & Co., St. Louis ... 8
Hydraulic Jacks.
Dudgeon Richard, 24 Columbia, N. Y. ... 36
Insurance, Boiler.
Hartford Steam Boiler Inspection and Insurance Co. ... 39
Iron Brokers.
Boynton Geo. A., 70 Wall, N. Y. ... 4
Coleman & Bro., Louisville, Ky. ... 4
Crane U. O., 104 John, N. Y. ... 4
Hatry A. G., Pittsburgh, Pa. ... 4
Hazard T. D., 204 Pearl, N. Y. ... 4
Iron Bridges.
Leighton Bridge and Iron Works, Rochester, N. Y. ... 18
Iron, Charcoal, *Warm or Cold Blast.*
Quincy John W., 98 William, N. Y. ... 4
Iron Commission Merchants.
Justice Cox Jr. & Co., 333 Walnut, Phila. ... 5
Hand Jas. C. & Co., 614 and 616 Market, Phila. ... 6
Mann Bros., 228 Dock, Phila. ... 5
Spooner & Collins, St. Louis, Mo. ... 4
Iron, Pig, *Importers of.*
Williamson James & Co. 69 Wall, N. Y. ... 4
Iron Pig, *Manufacturers of*
Parrott Peter P., Greenwood Fce., Orange co., N. Y. 4
Iron Dealers.
Abeel Brothers, 190 South, N. Y. ... 4
Bonnell, Botsford & Co., Youngstown, O. ... 4
Borden & Lovell, 70 and 71 West, N. Y. ... 4
Cleveland, Brown & Co., Cleveland, O. ... 6
Cooney Daniel F., 88 Washington, N. Y. ... 4
Huerstel G., 99 Market Slip, N. Y. ... 4
Fuller, Lord & Co., 139 Greenwich, N. Y. ... 4
Fuller, Dana & Fitz, 110 North, Boston ... 2
Wm. Gardner's Sons, 575 Grand, N. Y. ... 4
Harrison & Gilloon, 558 to 562 Water, N. Y. ... 4
Holden, Hopkins & Stokes, 104 John, N. Y. ... 4
Jackson & Chase, 206 and 208 Franklin, N. Y. ... 4
Judson B. F., 457 and 459 Water, N. Y. ... 4
Matthews Chas. W. 133 Walnut, Phila. ... 5
Moseley, Hodgman & Co., 79 Washington, Boston, Mass. ... 5
Ogden Wallace, 85, 87-89 and 91 Elm, N. Y. ... 4
Pierson & Co., 24 Broadway, N. Y. ... 4
Quincy John W., 98 William, N. Y. ... 4
Reed John H. & Co. ... 6
Richards D. W & Co., 93 Mangin St. N. Y. ... 4
Snyder Asa, Richmond, Va. ... 4
Wallace Wm. H. & Co., Albany and Washington streets, N. Y. ... 4
Warner A. B. & Sons, 28 and 29 West, N. Y. ... 4
Williamson James & Co., 69 Wall, N. Y. ... 4
Whitney A. R. & Bro., 58 Hudson N. Y. ... 4
Iron, *Manufacturers of.*
Britannia Iron Works, Middlesbro', Eng. ... 6
Burden Iron Works, Troy, N. Y. ... 4
Cleveland Rolling Mill Co., Cleveland, O. ... 6
Coffin Wm. E. & Co., 8 Oliver, Boston ... 4
Boston Rolling Mills, 17 Batterymarch, Boston ... 4
Everson, Macrum & Co., Pittsburgh, Pa. ... 4
J. & J. Rogers Iron Co., Ausable Forks, N. Y. ... 5
Lackawanna Iron and Coal Co., Scranton, Pa. ... 5
Leonard John, 450 & 451 West st. N. Y. ... 4
McIntyre & Co., Richmond, Va. ... 12
Milwaukee Iron Co., Milwaukee, Wis. ... 6
Old Dominion Iron & Nail Works Co., Richmond, Va. 6
Oxford Iron Co., 81 Washington, N. Y. ... 6
Phœnix Iron Co., 410 Walnut, Phila. ... 5
Rowland Wm. & Harvey, Phila. ... 40
Shoenberger & Co., Pittsburgh, Pa. ... 4
Taylor, Mitchell & Pond, Massillon, O. ... 4
Iron, Swedish, *Importers of.*
Fuller, Dana & Fitz, Boston, Mass. ... 2
Jessop Wm. & Sons, 91 and 93 John, N. Y. ... 32
Mitander Nils, 69 William, N. Y. ... 4
Keys and Cotters, *Manufacturers of.*
Barnes Geo. & Co., Syracuse, N. Y. ... 36
Knitting Machines, Upright Rotary, *Makers of.*
Clark Tompkins, Troy, N. Y. ... 36
Lace Leather, *Manufacturers of.*
Fales Geo. S., Pawtucket, R. I. ... 19
Lanterns, *Manufacturers of.*
Dietz R. E., (Tubular) 54 and 56 Fulton, N. Y. ... 40
Howard & Morse, 45 Fulton, N. Y. ... 2
White Mfg. Co., Bridgeport, Ct ... 25
Lead Pipe &c., *Manufacturers of.*
Bayley, Farrell & Co., Pittsburgh, Pa. ... 2
Locks. *Manufacturers of*
American Lock Mfg. Co., Cazenovia, N. Y. ... 17
Bohannan Wilson, Broadway and Kossuth, Brooklyn, E. D. ... 18
D. K. Miller Lock Co., 112 Cherry, Philadelphia ... 40
Romer & Co., Newark, N. J. ... 11
Tower John J., 96 Chambers, N. Y. ... 34
Union Nut Co., 78 Beekman, N. Y. ... 13
Yale Lock Mfg. Co., 298 Broadway, N. Y. ... 33
Lubricators, (Patent) *Maker of.*
Crossley H., Brooklyn, N. Y. ... 36
Machinery, *Makers of.*
Forsaith S. C. & Co., Manchester, N. H. ... 39
Hendey Machine Co., Wolcottsville, Ct. ... 19
Pratt & Whitney Co., Hartford, Conn. ... 38
Sellers Wm. & Co., 1600 Hamilton, Phila. ... 39
The Hull & Belden Co., Danbury, Conn. ... 38
Walker Joseph, 915 Market, Phila., Pa. ... 36
Wetherill Robert & Co., Chester, Pa. ... 38
Whittier Machine Co., 1176 Tremont, Boston, Mass. ... 38
Wood Thomas, 2106 Wood, Phila. ... 39
Machine Screws, *Makers of.*
Boone W. C., 18 Humboldt, Brooklyn, E. D. ... 13
Lyon & Fellows Mfg. Co., Williamsburg, N. Y. ... 12
Reynolds & Co., New Haven, Conn. ... 4
Machinists' Tools. *Makers of.*
Blaisdell P. & Co., Worcester Mass. ... 38
Fitchburg Machine Co., Fitchburg, Mass. ... 36
Harrington Edwin & Son, 15th st. and Pa. ave., Phila. 39
Jones, Lamson & Co., Windsor, Vt. ... 35
Le Count C. W., South Norwalk, Conn. ... 10
New Haven Mfg. Co., New Haven, Ct. ... 39
Van Haagen C. & Co., Phila., Pa. ... 36
Malleable Articles, *Maker of.*
Hammer & Co., Branford, Ct. ... 10
Mallets. *Makers of*
New York Mallet and Handle Works, 456 E. Houston, N. Y. ... 9
Measuring Tapes.
Eddy Geo M & Co., 353 Classon Ave., Brooklyn, N. Y 10
Metal Dealers and Brokers.
Coddington T. B. & Co., 25 and 27 Cliff, N. Y. ... 2
Cort N. L. & Co., 220 & 222 Water, N. Y. ... 2
Crane U. O., 104 John, N. Y. ... 4
Crocker Bros., 32 Cliff, N. Y. ... 9
Fuller, Dana & Fitz, Boston, Mass. ... 2
Gregg H. L. Co., 108 Walnut, Phila. ... 5
Lefferts J. C., 241 Pearl, N. Y. ... 4
W. J. Hammond, Pittsburgh, Pa. ... 2
Phelps, Dodge & Co., Cliff, bet. John & Fulton, N. Y. 2
Purves A. & Son, cor. South and Penn, Phila. ... 20
Quincy J. W., 98 William, N. Y. ... 2
Sturges Frank & Co., 72, 74 & 76 Lake, Chicago ... 3
Thomson A. A. & Co., 213 and 215 Water, N. Y. ... 2
Van Wart & McCoy, 134 and 136 Duane N. Y. ... 2
Metaline.
American Metaline Co., 61 Warren ... 38
Metallurgists.
Britton J. Blodgett 339 Walnut, Phila. ... 6
Maynard & Van Rensselaer, 26½ Broadway, N. Y. ... 6
School of Mines, E. 49th, N. Y. ... 6
Wallace & Humphrey, 113 Walnut, Phila. ... 6
Metal Roofing.
Hickcox Mfg. Co., 280 Pearl, N. Y. ... 4
Meat Chopping Machinery.
Murray Iron Works, Burlington, Iowa ... 28
Miners' Candles, *Makers of*
James Boyd's Sons, 10 and 12 Franklin, N. Y. ... 39
Mining Spikes
Roseberry Geo. D., Pottsville, Pa. ... 4
Molders' Tools.
Carter H., 290 Pearl, N. Y. ... 10
Molding Machines, *Makers of*
P. & F. Corbin, 87 Chambers, N. Y. ... 36
Mouse Traps, Catchemalive, *Makers of.*
Dietz R. E., 54 and 56 Fulton, N. Y. ... 40
Nails.
Schoenberger & Co., Pittsburgh, Pa. ... 4
Nail Pullers.
Maltby, Curtiss & Co., 34 Reade, N. Y. ... 34
Nickel Platers.
Hartman John, 37½ N. Seventh, Philadelphia ... 2
New York Nickel Plating Co. 133 West 25th, N. Y. ... 27
Owen S. S. & Co., 121 E. 13, N. Y. ... 27
Roehrig, Fred Wm., 217 Center, N. Y. ... 27
Norway Shapes, *Rollers of.*
Rowland Wm. & Harvey, Frankford, Phila. ... 40
Note Broker.
Gallaudet P. W., 3 and 5 Wall, N. Y. ... 5
Nuts, Bolts, etc., *Makers of.*
American Bolt Co., 210 Lawrence, Lowell, Mass. ... 13
Carpenter David & Sons 472 Water N. Y. ... 4
Clark Bros. & Co., Milldale, Conn. ... 12
Fuller, Lord & Co., 139 Greenwich, N. Y. ... 4
Haskell W. H. & Co., Pawtucket, R. I. ... 13
Hoopes & Townsend, 1330 Buttonwood, Phila. ... 12
Lewis, Oliver & Phillips, Pittsburgh, Pa. ... 13
New Haven Nut Co., Westville, Ct. ... 10
Old Colony Rivet Works, 116 Chambers, N. Y. ... 12
Roseberry Geo. D., Pottsville, Pa. ... 4
Russell, Birdsall & Ward, Port Chester, N. Y. ... 40
Plumb, Burdict & Barnard, Buffalo, N. Y. ... 40
Shelton Co., Birmingham, Conn. ... 34
Sternbergh J. H., Reading, Pa. ... 13
Union Nut Co., 78 Beekman N. Y. ... 13
Oil Lubricating, *Makers of*
Lester Oil Co. 183 Water, N. Y. ... 37
Oil Stones, *Makers of.*
Boyd & Chase, 107th street and 1st avenue, N. Y. ... 37
Old Iron, etc.
Gregg H. L. & Co., 108 Walnut, Philadelphia ... 5
Ore Crushers.
Blake Crusher Co., New Haven, Ct. ... 38
Packing for Engines, &c., *Manufacturers of.*
Glanding Jas. & Co., 115 Queen, Philadelphia ... 38
Paints and Oils, *Dealers in.*
Devoe F. W. & Co., 117 Fulton, N. Y. ... 27
Empire Iron Clad Paint Co., 20 West B'way, N. Y. ... 16
Patent Solicitors.
A. V. Briesen, 258 Broadway, N. Y. ... 20
Burke & Fraser, 37 Park Row, N. Y. ... 28
Cox & Cox, 229 Broadway, N. Y. ... 28
Howson & Son, Phila. and Washington, D. C. ... 28
Munn & Co., *Scientific American* 37 Park Row N. Y. ... 36
Nye Francis C., 13 Murray, N. Y. ... 28
Simonds W. E., Hartford, Ct. ... 28
Spencer A. H., 28 State Boston, Mass. ... 28
Stetson T. D. 23 Murray, N. Y. ... 28
Picture Nails, etc., *Manufacturers of.*
Richards T. C. & Co., 47 Murray, N. Y. ... 3
Pipes, Fittings, etc., *Makers of.*
Eaton, Cole & Burnham Co., 58 John, N. Y. ... 26
Meyer Henry C. & Co., 48 Cliff, N. Y. ... 40
McNab & Harlin Mfg. Co., 56 John, N. Y. ... 26
Pancoast & Maule, 227 Pear, Phila. ... 26
Pipe Threaders, Cutters, &c.
Converse, M. D., 68 Park Place, N. Y. ...
Empire Mfg. Co., 48 Gold, N. Y. ... 25
Pipe, Water and Gas, *Makers of.*
Barr Edward, 78 John, N. Y. ... 26
Leighton Bridge and Iron Works, Rochester, N. Y. 18
McNeal John & Sons, Burlington, N. J. ... 6
National Tube Works Co., 78 William, N. Y. ... 26
Warren Foundry & Mach. Co., Phillipsburg, N. J. ... 6
Wood R. D. & Co., 400 Chesnut, Phila. ... 26
Piston Packing.
Canfield John & Co., 1321 Fairmount Ave., Phila. ... 36
Plane Irons, *Manufacturer of*
Buck Bros., Millbury, Mass. ... 13
Mack & Co., Rochester, N. Y. ... 25
Middletown Tool Co., 18 & 20 Cliff, N. Y. ... 6
Planes, *Manufacturers of.*
Greenfield Tool Co., Greenfield, Mass. ... 34
Mack & Co., Rochester, N. Y. ... 25
Stanley Rule & Level Co., 35 Chambers, N. Y. ... 35
Plated Ware
Derby Silver Co., Derby, Ct. ... 40
Reed & Barton 2 Maiden Lane, N. Y. ... 33
Plows, Chilled Iron, *Makers of.*
South Bend Iron Works, South Bend, Ind. ... 25
Plumbago Lubricator.
Joseph Dixon Crucible Co., Jersey City, N. J. ... 40
Plumbers' Materials, *Manufacturers of*
Baltimore Bell and Brass Works, 53 and 55 Holliday, Baltimore, Md. ... 12
Everhart Jas. M., Scranton, Pa ... 40
Carr Wm. S. & Co., 106 Centre, N. Y. ... 26
Power Hammers, *Makers of.*
Forsaith S. C. & Co., Manchester, N. H. ... 39
Presses, Power, *Makers of.*
Boomer & Boschert Press Co., Syracuse, N. Y., and 26 Beekman, N. Y. ... 39
The Stiles & Parker Press Co., Middletown, Ct. ... 36
Pressure Blowers, *Makers of.*
Wild R. W., 20 Cortlandt, N. Y. ... 33
Sturtevant B. F., 72 Sudbury, Boston ... 36
Pumps, *Makers of.*
Clayton Jas., 11 Water, Brooklyn, N. Y. ... 5
Douglas W. & B., Middletown Conn. ... 7
Rumsey & Co., Seneca Falls, N. Y. ... 7
Union Mfg. Co., 99 Chambers, N. Y. ... 7
Pyrometers.
Brown Edward, 311 Walnut, Phila.
Railroad Supplies.
American Steel Frog Co., Harrisburg, Pa. ... 12
Duyckinck W. C., 50 and 52 John, N. Y. ... 8
Jackson & Tyler Baltimore, Md. ... 37
Rogers H. A., 19 John, N. Y. ... 14
Rails, Iron or Steel, *Makers of.*
Atkins Bros., Pottsville, Pa. ... 6
Cambria Iron Co., Johnstown, Pa. ... 5
Cleveland Rolling Mill Co., Cleveland, O. ... 6
Griswold John A. & Co., Troy, N. Y. ... 33
Lackawanna Iron and Coal Co., Scranton, Pa. ... 5
Milwaukee Iron Co., Milwaukee, Wis. ... 6
Railway Track Tools.
American Steel Frog Co., Harrisburg, Pa. ... 12
Razor Straps, *Makers of.*
B. F. Badger, Charlestown, Mass. ... 18
Refrigerators, *Makers of*
Lesley Alex. M., 226 W. 23d st., N. Y. ... 35
Revolvers.
Tryon E. K., Jr., & Co., 220 N. 2d, Philadelphia ... 16
Rivets.
Old Colony Rivet Works 54 Warren, N. Y. ... 12
Timme's Son Peter, 281 North 6th, Brooklyn, E. D. ... 4
Road Scrapers, &c., *Makers of.*
Revolving Scraper Co., Columbus, O. ...
Rolling Mill Machinery, etc., *Manufacturers of.*
Moore James, Cor 16th and Buttonwood, Phila. ... 36
Rules, *Manufacturers of.*
Stanley Rule and Level Co., 35 Chambers St. ... 35
Stephens & Co, Riverton, Ct. ... 3
Saddlery Hardware, *Makers of*
Sargeant Mfg. Co., Newark, N. J. ... 17
Sad Irons, *Makers of*
Brooklyn Sad Iron Co, Brooklyn, E. D., N. Y. ... 24
Safe Deposit Co.
Penna. Warehousing & Safe Deposit Co., Front and Lombard, Philadelphia ... 27
Sand and Emery Paper, *Makers of*
Baeder, Adamson & Co., 730 Market, Phila. ... 6
Sash Locks *Makers of.*
Hammond W. S., Lewisberry, Pa. ... 35
Saws, *Makers of.*
American Saw Co., Trenton, N. J. ... 10
Atkins E. C. & Co., Indianapolis, Ind. ... 10
Boynton E. M., 80 Beekman N. Y. ... 10
Flint J., Rochester, N. Y. ... 10
Disston Henry & Sons, Phila. ... 29
James Ohlen, Columbus, O. ... 10
Peace Harvey W., Williamsburg, N. Y. ... 10
Spear & Jackson, 100 Chambers, N. Y. ... 33
Wheeler, Madden & Clemson Mfg. Co., Middletown, N. Y. ... 10
Saw Frames, Wood, *Makers of.*
Boynton E. M. 80 Beekman, N. Y. ... 10
Peace Harvey W., Williamsburg, N. Y. ... 10
Seives, Metallic, *Makers of*
Mann R. J. & Co., St. Louis, Mo. ... 34
Seamless Tubes. *Makers of*
Merchant & Co., Phila., Pa. ... 2
Scales, *Manufacturers of.*
Chattillon John & Sons, 91 Cliff, N. Y. ... 9
Fairbanks E. and T. & Co., St. Johnsbury Vt. ... 33
Riehle Bros., 9th near Coates, Phila. ... 26
Screws, *Makers of.*
Miles F. S., 206 Quarry, Phila. ... 12
Screws, *Importers of.*
Bruce Geo. W., 1 Platt, N. Y. ... 4
Field Alfred & Co., 93 Chambers, N. Y. ... 6
Gueutal George & Son, 39 W. 4th, N. Y. ... 10
Shovels, &c.
Clement & Hawks Mfg. Co., Northampton, Mass. ... 12
Middleboro Shovel Co., 63 Oliver, Boston ... 34
N. Y. Shovel Works (Screening Shovels), 1358 Broadway N. Y. ... 13
Semple Birge & Co., St. Louis, Mo. ... 33
Sheet Metal Workers.
East River S. M. Mfg. Co., 253 Pearl, N. Y. ... 16
Shears, Scissors &c.
R. Heinisch's Sons, 8 1 Broadway, N. Y. ... 11
Ryals Jas., Collinsville, Ct. ... 11
Skates, *Makers of*
Peck & Snyder, 126 Nassau, N. Y. ... 18
The Florence Sewing Mch. Co., Florence, Mass. ... 26
Shutters, Self Coiling, *makers of*
Clark & Co., 218 W. 26th st ... 17
Smelting Works.
Hooks Smelting Co., Phila., Pa. ... 3
Reeves Paul S., 760 South Broad St. Phila. ... 40
Stamped and Japanned Tin Ware.
Shepard Sidney & Co., Buffalo, N. Y. ... 31
Sturges Frank & Co., 72, 74 & 76 Lake, Chicago ... 3
Steam Hammers, etc., *Makers of.*
Bradley Mfg. Co., Syracuse, N. Y. ... 38
Dudgeon Richard, 24 Columbia, N. Y. ... 36
Stencils, *Manufacturers of*
Stafford Mfg. Co., 66 Fulton, N. Y. ... 25
Snaps, Harness, *Makers of.*
Hold Back and Snap Co., Troy, N. Y. ... 34
Middletown Tool Co., 18 & 20 Cliff, N. Y. ... 6
Spikes, R. R., &c., *Manufacturers of*
Fahrion, G. W. Warren, Ohio ... 5
Spoons, *Makers of*
Kann & Sons Mfg. Co., Baltimore, Md. ... 11
Springs.
Rowland Wm. & Harvey, Frankford, Phila. ... 40
Squares, Steel and Iron, *Makers of.*
Hart, Bliven & Mead Mfg. Co., 243 Pearl, N Y. ... 34
Steam Pumps, etc., *Manufacturers of*
Carr A. 43 Cortlandt, N. Y. ... 26
Crane Bros. Mfg. Co. Chicago, Ill. ... 37
Foster & Jamieson, 13 Adams, Brooklyn, N. Y. ... 37
Knowls Steam Pump Works, Warren, Mass. ... 38
Steam Traps
Richards & Pike, 205 Ledger Place, Philadelphia ... 37
Albany Steam Trap Co., Albany, N. Y. ... 38
Steel Castings, *Manufacturers of*
Flagg Stanley G. & Co., 216 & 218 N. 3rd, Phila. ... 40
McIntyre & Co., Richmond, Va. ... 12
Chester Castings Co., Evelina, Phila. Pa. ... 20
Steel Importers.
Carr J. & Riley, 82 John, N. Y. ... 32
Cocker Bros., Sheffield, England ... 32
Hobson Francis & Son, 97 John, N. Y. ... 32
Jessop Wm. & Sons, 91 and 93 John, N. Y. ... 32
Moss F. W., 80 John, N. Y. ... 32
Nicholson John & Sons, 88 Chambers, N. Y. ... 32
Piersons & Co., 24 Broadway, N. Y. ... 4
Sanderson Bros. & Co., 16 Cliff, N. Y. ... 32
Sanderson Geo. & Co., 57 John, N. Y. ... 32
Van Wart & McCoy, 134 and 136 Duane, N. Y. ... 32
Wardlow S. & C., 95 John, N. Y. ... 32
W. Hawksworth, Ellison & Co., 72 John, N. Y. ... 32
Steel Manufacturers.
Anderson & Woods, Pittsburgh ... 33
Chrome Steel Co., Brooklyn, E. D. ... 32
Cleveland Rolling Mill Co., Cleveland, O. ... 6
Gautier D. G. & Co., Jersey City, N. J. ... 33
Farist & Windsor Bridgport, Ct. ... 33
Griswold John A. & Co., Troy, N. Y. ... 33
Hussey, Wells & Co., Pittsburgh ... 33
Midvale Steel Works, Nicetown, Phila., Pa. ... 32
Miller, Barr & Parkin, Pittsburgh ... 32
Rowland Wm. & Harvey, Frankford Phila. ... 40
Smith, Sutton & Co., Pittsburgh, Pa. ... 33
Singer, Nimick & Co., Pittsburgh ... 32
Step Ladders, *Makers of*
Adams F. F. & Co., Erie, Pa. ... 9
Stop Gates (Water Gas &c.) *Makers of*
Hurchinson J. R. & Co., Allegheny, Pa.
Stone Crushing Machines.
Blake Crusher Co., New Haven, Ct. ... 38
Stoves, *Makers of*
Burdett, Smith & Co., Troy, N. Y. ... 19
Perry & Co., Albany, N. Y. ... 16
Stove Boards, *Manufacturers of.*
Shepard Sidney & Co., Buffalo N. Y. ... 31
Stove Polish, *Makers of*
National Stove Polish Co. 74 Pearl, Buffalo, The N. Y. ... 16
Joseph Dixon Crucible Co., Jersey City, N. J. ... 40
Twist Drills, *Makers of.*
Morse Twist Drill & Mach. Co., N. Bedford, Mass. ... 35
Tackle Blocks, *Makers of.*
Burr & Co., 31 Peck Slip N. Y. ... 35
Penfield Block Works, Lockport, N. Y. ... 13
Tiebout W. & J., 290 Pearl, N. Y. ... 12
Tacks.
American Tack Co., 117 Chambers, N. Y. ... 18
Dunbar, Hobart & Whidden, 116 Chambers, N. Y. ... 17
Field A. & Sons, Taunton, Mass ... 9
Grundy & Kenworthy, 165 Greenwich, N. Y. ... 34
Loring Samuel, Plymouth, Mass. ... 34
Shelton Co., Birmingham, Ct. ... 34
Time Detectors.
Imhausen & Co., 212 Broadway, N. Y. ... 35
Tinners' Tools and Machines.
Headley W. L., 35 William, N. Y. ... 28
Toe Calks.
Bussing Abraham, 35 Chambers, N. Y. ... 27
Transfer Ornaments.
Fechteler Julius, 104 John, N. Y. ... 19
Tube Cleaners.
The Chalmers Spence Co., foot of E. 9th, N. Y. ... 36
Tube Expanders.
Dudgeon Richard, 24 Columbia, N. Y. ... 36
Valves, Gas, Water and Steam.
Chapman Valve Mfg. Co., 75 & 77 Kilby, Boston ... 26
Mohawk & Hudson Mfg. Co., Waterford, N. Y. ... 38
Stevens & McLean, 298 and 300 Monroe, N. Y. ... 37
Ludlow Valve Mfg. Co., Troy, N. Y. ... 39
Vises.
Millers Falls Co., 73 Beekman, N. Y. ... 25
Fisher & Norris Trenton, N. J. ... 25
Hall Thomas, 411 Fulton, Brooklyn, N. Y. ... 25
Trenton Vise & Tool Works, 101 & 103 Duane, N. Y. ... 4
Wilson Mfg. Co., 37 Chambers N. Y. ... 39
Washers, *Makers of*
Oakley & Keating, 40 Cortlandt, N. Y. ... 33
Water Motor.
Backus Bros., Newark, N. J. ... 37
Welding Compounds.
Schierloh H., 21 Exchange Place, Jersey City, N. J. ... 8
Weighing Machines.
Robt. King, 246 Plymouth, Brooklyn, N. Y. ... 37
White Lead, *Manufacturers of*
Brooklyn White Lead Co., 89 Maiden Lane, N. Y. ... 16
Colgate Robert & Co., 287 Pearl, N. Y. ... 16
Jewett John & Sons 182 Front, N. Y. ... 16
Lewis John T. & Bros., 231 S. Front, Phila., Pa. ... 16
Wetherill & Bro., 31st, below Chestnut, Phila. ... 16
Window Springs, *Makers of*
Hammond W. S., Lewisberry, Pa. ... 35
Wire, *Manufacturers of.*
Gilbert & Bennett Mfg. Co., 273 Pearl, N. Y. ... 8
Prentiss Geo. W. & Co., Holyoke, Mass. ... 2
Roberts Henry, Newark, N. J. ... 2
Townsend W. P. & Co., Pittsburgh, Pa. ... 4
Washburn & Moen Mfg. Co., Worcester, Mass. ... 2
Trenton Iron Co., Trenton, N. J. ... 4
Wire Goods, *Manufacturers of.*
Barnum E. T. Detroit, Mich. ... 2
Corning Jasper E., 58 Cliff, N. Y. ... 28
Gilbert & Bennett Mfg. Co., 273 Pearl, N. Y. ... 2
Howard & Morse, 45 Fulton, N. Y. ... 2
Parker Sam'l & Co., Wethersfield, Ct. ... 2
Tyler W. S., Cleveland, O. ... 8
Wire Rope, Iron and Steel, *Makers of.*
Hazard Mfg. Co., Wilkesbarre, Pa. ... 2
Roebling's John A. Sons, Trenton, N. J. ... 2
Wood Tools, *Makers of*
Gleason E. & F., 27 Haydock, Phila. ... 36
Wrenches, *Manufacturers of.*
Austin J. & Co., 168 Fulton, N. Y. ... 26
Bemis & Call Hdw. & Tool Co., Springfield, Mass. ... 10
Coes A. G. & Co., Worcester, Mass. ... 34
Coes L. & Co., Worcester Mass. ... 12
Lowell Wrench Co., Worcester, Mass ... 24
Wringers, *Dealers in.*
Alexander T. J., Olive and High, Boston ... 8
Bailey Wringing Machine Co., 106 Chambers, N. Y. ... 16

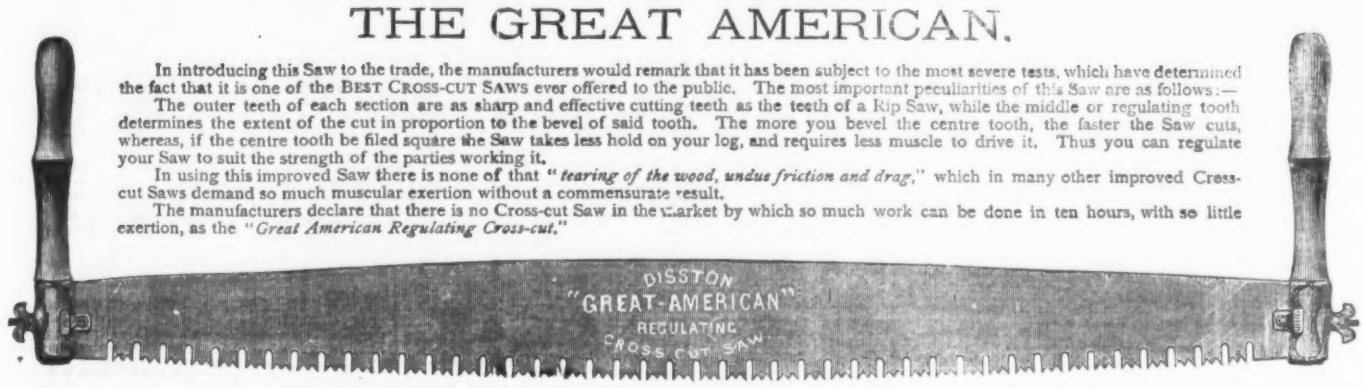
HENRY DISSTON & SONS,

Keystone Saw, Tool, Steel and File Works.

Front and Laurel Streets, Philadelphia.

Our Celebrated CROSS-CUT AND WOOD SAWS.

THE GREAT AMERICAN.

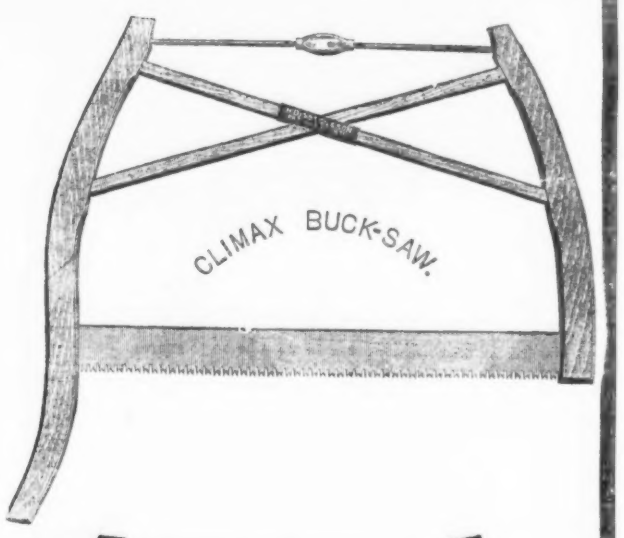


In introducing this Saw to the trade, the manufacturers would remark that it has been subject to the most severe tests, which have determined the fact that it is one of the BEST CROSS-CUT SAWS ever offered to the public. The most important peculiarities of this Saw are as follows:—

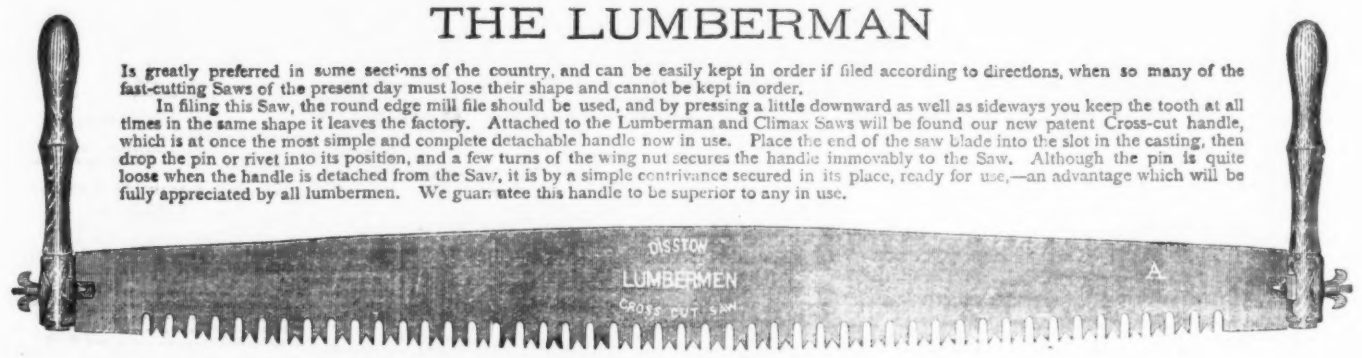
The outer teeth of each section are as sharp and effective cutting teeth as the teeth of a Rip Saw, while the middle or regulating tooth determines the extent of the cut in proportion to the bevel of said tooth. The more you bevel the centre tooth, the faster the Saw cuts, whereas, if the centre tooth be filed square the Saw takes less hold on your log, and requires less muscle to drive it. Thus you can regulate your Saw to suit the strength of the parties working it.

In using this improved Saw there is none of that "*tearing of the wood, undue friction and drag*," which in many other improved Cross-cut Saws demand so much muscular exertion without a commensurate result.

The manufacturers declare that there is no Cross-cut Saw in the market by which so much work can be done in ten hours, with so little exertion, as the "*Great American Regulating Cross-cut.*"

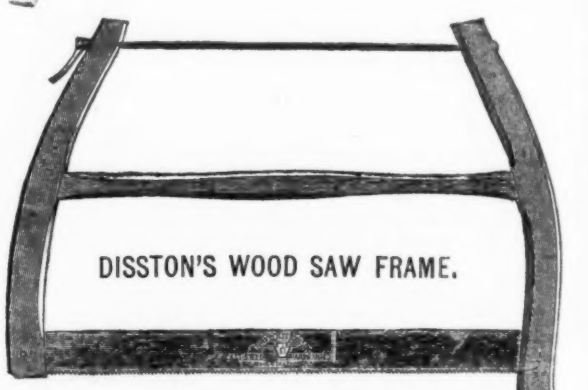


THE LUMBERMAN

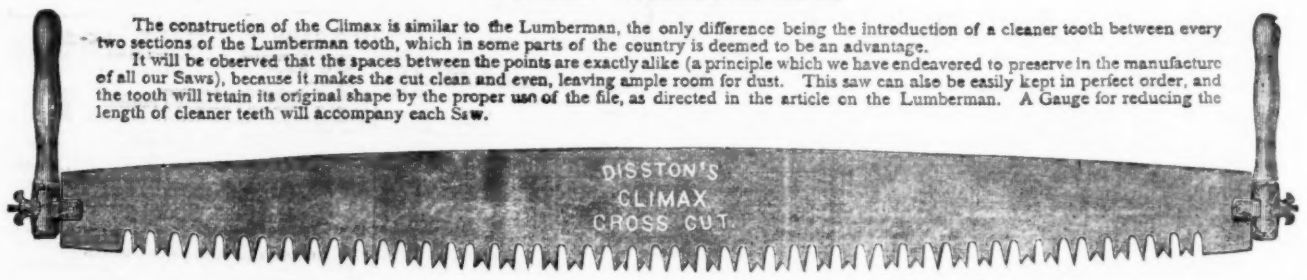


Is greatly preferred in some sections of the country, and can be easily kept in order if filed according to directions, when so many of the fast-cutting Saws of the present day must lose their shape and cannot be kept in order.

In filing this Saw, the round edge mill file should be used, and by pressing a little downward as well as sideways you keep the tooth at all times in the same shape it leaves the factory. Attached to the Lumberman and Climax Saws will be found our new patent Cross-cut handle, which is at once the most simple and complete detachable handle now in use. Place the end of the saw blade into the slot in the casting, then drop the pin or rivet into its position, and a few turns of the wing nut secures the handle immovably to the Saw. Although the pin is quite loose when the handle is detached from the Saw, it is by a simple contrivance secured in its place, ready for use,—an advantage which will be fully appreciated by all lumbermen. We guarantee this handle to be superior to any in use.

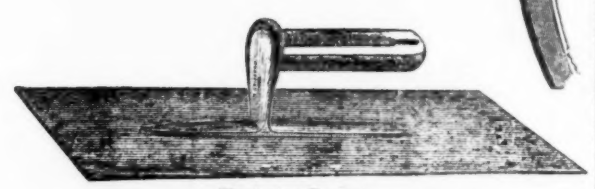


THE CLIMAX.

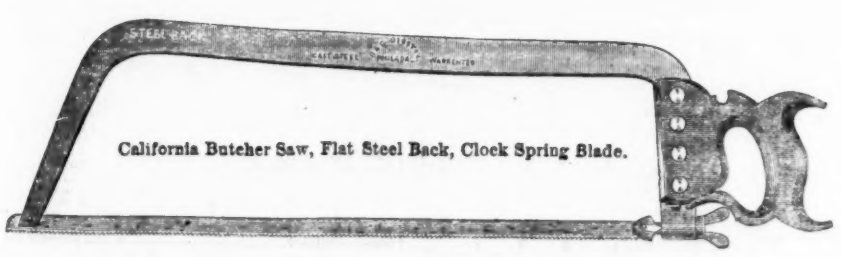


The construction of the Climax is similar to the Lumberman, the only difference being the introduction of a cleaner tooth between every two sections of the Lumberman tooth, which in some parts of the country is deemed to be an advantage.

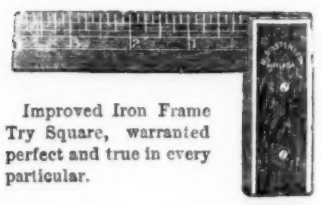
It will be observed that the spaces between the points are exactly alike (a principle which we have endeavered to preserve in the manufacture of all our Saws), because it makes the cut clean and even, leaving ample room for dust. This saw can also be easily kept in perfect order, and the tooth will retain its original shape by the proper use of the file, as directed in the article on the Lumberman. A Gauge for reducing the length of cleaner teeth will accompany each Saw.



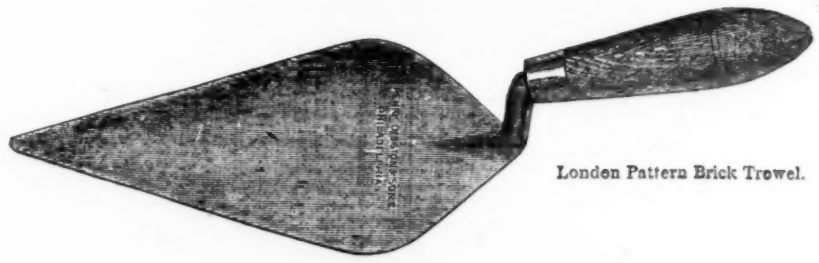
Plastering Trowel.



California Butcher Saw, Flat Steel Back, Clock Spring Blade.



Improved Iron Frame Try Square, warranted perfect and true in every particular.

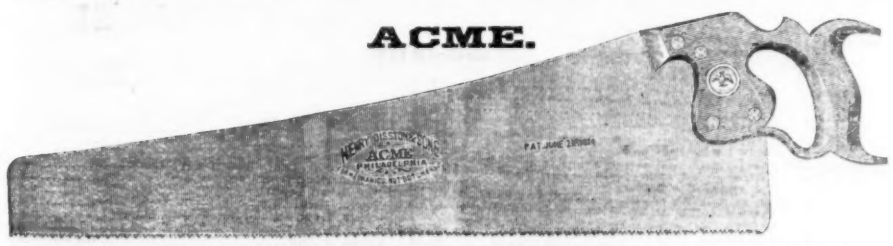


London Pattern Brick Trowel.

HENRY DISSTON & SONS'

New Patent Skew-back Hand-Saw,

ACME.

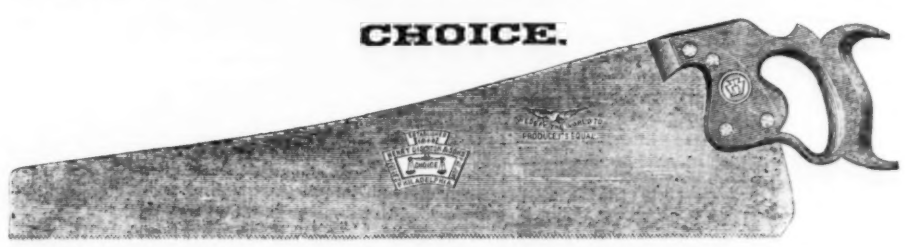


We consider these Saws to be the ACME of perfection. So say all first-class Mechanics who have used them.

HENRY DISSTON & SONS'

New Patent Skew-back Hand-Saw,

CHOICE.

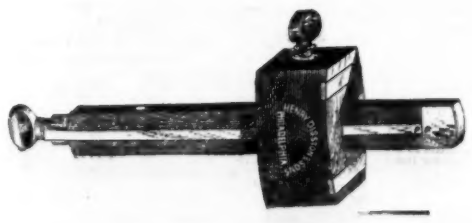


This Saw is the "CHOICE" of all first-class Mechanics who have used it.

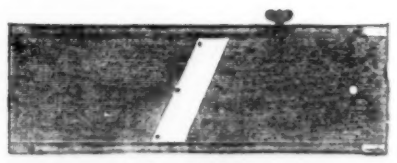
HENRY DISSTON & SONS'

Patent Skew-back Hand-Saw

NEW No. 7.



Even in price and quality with our celebrated No. 7 Saw. Warranted to give satisfaction every time.



Slaw Cutter.

New York Wholesale Prices, October 27, 1875.

HARDWARE.

Anvils.
Wright's ... ⅌ ℔ gold 11c; over 250 ℔s 11¼c, gold
Armitage's Mouse Hole ... gold 11c
Wilkinson's ... ⅌ ℔ gold 11c
Eagle Anvils ... ⅌ ℔ 8c

Apple Parers.
Domestic, Turn Table, Lightning, Hudson's, Reading, Union ... $7.75 ⅌ doz
Skeleton Paring, Coring and Slicing ... $3 00 ⅌ doz net
Bay State, Paring, Coring and Slicing ... $15 00 dis 10 %
Climax Slicer ... 8 00

Ash Sifters.
J. E. Corning's Barrel Head ... dis 10 %

Augers and Bits.
Conn. Valley Mfg. Co., Douglass, Ives, Beecher (French, Swift & Co), Griswold, Challenge ... 1st quality ... dis 40&10 %
Nobles Mfg. Co ... dis 40 @ 40&5 %
Cook's ... dis 40&10&10 %
Diamond Hardware Co ... dis 25&10&10 %
Snell Mfg. Co ... dis 25 %
Jennings' Bits ... dis 10 %
Lewis' Single Twist Bits ... dis 30 %
Andrews' Bits ... dis 25 %
Griswold's Patent Bits ... dis 30 %
Expansive Bits, Clark's ... small, $18; large, $26—dis 15 %
" " Ives' ... $20 @ $30—dis 30 %
" " Blake's ... $20—dis 40 %
Hollow Augers, Douglass', Ives', French, Swift & Co ... dis 40 %
" " Bonney's Adjustable. ⅌ doz $48—dis 25 %
" " Stearns' " ⅌ doz $48—dis 25 %
" " Ives' Expansive ... each $4·50—dis 40 %
" " Universal Expansive. each $4·50—dis 10 %
Gimlet Bits—Screw, $7·50; no screw, $9 ... dis 20&10 %
Double Cut Gimlet Bits, Shepardson's ... dis 20 %
" " Ct. Valley Mfg. Co. dis 30&10 %
" " Hartwell's ... dis 50 %
" " Douglass' ... dis 25&10 %
" " Ives' ... dis 30 %
Morse's Bit Stock Drills ... dis 20 %
L'Hommedieu's Ship Augers ... dis 20 %
Watrous Ship Augers ... dis 20 %
Vaughan's Post Hole—
6 in. $23 60; 7, 8 and 9 in. $25 per doz ... dis 20 %

Awls, Brad Sets, &c.
Awls, Sewing, Common ... per gross $1·20—dis 15 %
" " Best ... per gross $1·60—net
" Shouldered Peg ... per gross 2·25—dis 15 %
" Patent Peg ... per gross ·00—dis 15 %
" Shouldered Brad ... per gross 2·25—dis 15 %
Brad Sets, Aiken's ... per doz $14·40—dis 25&10 %
" No. 42, $10·50; No. 43, $12·50 ... dis 45&10 %
" Clark's ... dis 40&10 %
" Stanley's Excelsior ... $18 50—dis 25&10 %

Axes.
Brook's ... per doz $12 00 @ 14 00 net
Blood's ... per doz $15 00 @ 16 50—dis 20 %
Hunt's ... ⅌ doz $12 50 @ 14 00
Collins' ... ⅌ doz 11 00 @ 15 50 net @ dis 5 %
H. Clark's (J. C. W. & Co.) bron'd or red. ⅌ doz $10 00 net
Hurd's ... ⅌ doz 10 50 @ 12 50
Simmons' ... ⅌ doz 11 00 @ 11 50
Morris' ... ⅌ doz 12 50 @ 13 50
Red Jacket ... ⅌ doz 12 00 @ 12 50
Mann's ... ⅌ doz 11 50 @ 13 00
" Double Bitted ... ⅌ doz 21 50 @ 22 00
Underhill's ... ⅌ doz 12 00 @ 13 00
" Crown ... ⅌ doz 12 50 @ 13 50
John Leverett's ... ⅌ doz 12 50 @ 15 50
Ten Eyck ... ⅌ doz $10 00 @ 12 50 net
M. H. Jones & Co ... ⅌ doz 10 50 @ 11 50 net
Nobles Mfg. Co ... per doz $10 50, net
Elephant ... per doz $10 50 @ 11 50 net

Axle Grease.—Frazer's ... ⅌ ℔ 6c.
Balances ... dis 35 %
Bands.—Plated ... new list dis 50&5 %
Iron Rim ... new list dis 25&5 %
Brass (Plated list) ... new list dis 50, 10&5 %
Oroide ... new list dis 50&5 %

Bells.
Hand, Light Brass ... dis 70&10 %
" Extra Heavy ... dis 40&10 %
" White Metal ... dis 50&10 %
" Silver Chime ... dis 20&10 %
" Swiss ... dis 25 %
" Globe (Cone's Patent) ... dis 20&10 %
Gong Abbe's ... dis 20&10 %
" Yankee ... dis 35&10 %
" Barton's ... dis 35 %
Crank, Taylor's ... dis 25 %
" Brook's ... dis 50 %
" Cone's ... dis 10 %
" Connell's ... dis 50&10 %
Lever, Sargent's ... dis 60&10&10 %
" Taylor's ... dis 25 %
" Hart, Bliven & Mead Mfg. Co ... dis 50&10 %
Pull, " " ... dis 50&10 %
" Brook's ... dis 50 %
" Western ... dis 25 %
Call ... dis 15 %
Cow—Common Wrought ... dis 20&10 %
" Western ... dis 20&10 %
" " Sargent's ... dis 50&10&10 %
" Kentucky "Star" ... dis 20&10 %
" " Sargent's ... dis 50&10&10 %
" Dodge's Genuine Kentucky, new list—
Nos. 0 1 1½ 2 3 4 5 6 Hog.
$12·00 10·00 9·00 8·00 6·00 5·00 3·50 2·50 5·00—dis 45 %
" Yaw's Genuine ... dis 35 %
" Texas ... dis 35 @ 40 %

Bellows.
Blacksmiths', Common, List of Sept. 15 ... dis 15 %
" Extra and Pittsburgh Pattern ... List net
Moulders' ... dis 30 %
Hand Bellows ... dis 10 %
Blind Adjusters.—Domestic ... ⅌ doz $3—dis 20 %
Blind Fasteners.
Mackrell's ... dis 30 %
Van Sand's, No. 2000, $14·00; No. 3705, $10·50.net @ dis 5 %
Washburn's Patent ... ⅌ gross $14 00 dis 10 %
Merriman's ... new list net
Blind Staples.
Boardman's Patent, ⅜ in. and larger ... ⅌ ℔ 3. c
" " ¼ in ... " 42 c
Blocks.
Tackle, Rope and Iron Strapped, Providence Tool Co.'s list ... dis 30 %
Burr's ... dis 10 %
Stanley Rule and Level Co ... dis 25&10 %
Bolts.
Cast Iron Barrel, Shutter, &c ... dis 60&10 %
Cast Iron Chain ... dis 60&10&10 %
Wrought Iron Barrel ... dis 50, 10&10 %
" Square ... dis 50, 10&10 %
" Shutter ... dis 60&10 %
Wrought Iron Flush, Stanley's ... dis 15&10 %
" " Sargent's ... dis 50&10&10 %
Carriage and Tire, Common ... dis 75 %
" " Norway Iron ... dis 50 & 10 %
" " R. B. & W ... (old list) dis 60 %
" " Philadelphia ... dis 60 %
" " Shelton's ... (old list) dis 60&10 %
Union Nut Company, old list ... dis 60&10 %
Stove ... dis 25 %
" R. B. & W ... dis 25 %
" Shelton's Shaved Head ... dis 25 %
Borax ... 16c. ⅌ ℔
Boring Machines.

	Upright.	Angular.
Hovey's, no Augers	3·15	4·00 net
" with Augers	5·00	6·00 net
Douglass', no Augers	3·25	4·00 net
" with Augers	5·00	6·00 net
Parr's, no Augers	5·00	7·50 dis 30 %
" with Augers	7·50	10·00 dis 30 %
Kellogg's, no Augers	5·25	6·75 dis 15 %
Sweets	4·5	6·25 dis 15 %
Snell's	4·5	6·25 dis 20
Phillips', with Augers		11·00 dis 25 %
Mortising Machines, $20·00 each		dis 20 %

Bow Pins.
Union Nut Co ... new list dis 50&10&5 %
Hotchkiss' ... dis 50 @ 55 %
Humason, Beckley & Co.'s ... dis 50&10&5 %
Sargent & Co.'s ... dis 50&10&10 %
Braces.
Barber's Patent ... dis 40&5 %
Q. S. Backus ... dis 40&10 %
Wilson Mfg. Co ... dis 10 %
Spofford's Patent ... dis 50 %
Noble's Patent ... dis 40&10 %
Ives Novelty ... dis 40&7½&10 %
" Camden ... dis 15&10 %
Common Bell (American) ... dis 25 %
Brackets.—Shelf ... dis 60&10 @ 65&10 %
Bright Wire Goods ... dis 65&1 & 10 %
Bull Rings.—Union Nut Co., new list. dis 50&5 %
Sargent's ... dis 60&10 %
Hotchkiss' ... 2½ in., $2 25 net
Bung Hole Borers.
Common and Ring ... dis 2 & 0 %
Ives' Tap Borers ... dis 10&10 @ 25 %
Enterprise Mfg. Co ... dis 25 %
Butchers' Cleavers.
Humason & Beckley Mfg. Co ... dis 20&10 %
Bradley's ... dis 25 %
Beatty's ... dis 30 %

2	3	4	5	6	7	8
$19·00	$21·00	$24·00	$27·00	$30·00	$33·50	$36 50 $40·00

Hart Mfg. Co ... dis 45&10 %

0	1	2	3	4	5	6
$25·25	$29·75	$34·25	$38·75	$43·25	$45·50	$54·00

Butts.
Wrought Brass ... dis 30 %
Cast Brass ... dis 30 %
Common Cast, not Drilled.
Fast Joint, Narrow ... New list July dis 30&10 %
" Broad ... " dis 40&10 %
" Jap'd ... " dis 35&10 %
Loose Joint, Narrow and Broad ... " dis 35&10 %
" Jap'd ... " dis 45&10 %
Parliament Butts & Mayer's Hinges ... " dis 4 &10 %
Loose Pin ... " dis 45&10 %
" Japanned ... " dis 5&10 %
Loose Pin, Jap'd, Plated Tips ... " dis 45&10 %
Drilled and Wired.
Fast Joint, Narrow ... New list July 1, dis 25&10 %
" Broad ... " dis 35&10 %
" " Japanned ... " dis 30&10 %
Loose Joint ... " dis 45&10 %
" Japanned ... " dis 45&10 %
Parliament and Mayer's Hinges ... " dis 35&10 %
Loose Pin ... " dis 40&10 %
" Japanned ... " dis 50&10 %
" " Plated Tips ... " dis 45&10 %
Union Mfg. Co.'s Fancy Butts.—
Figured Enameled Loose Joint ... dis 55&10 %
Nickel Plated " ... dis 33⅓&10 %
Boston Finish, Plain ... dis 80&5 %
" " with Iron Acorns ... dis 75&5 %
" " with Sil'd " ... dis 65&5 %
Wrought Iron.
Fast Joint, Narrow, Lt. and Regular ... dis 30 %
" Broad ... dis 35 %
Loose Joint, Narrow and Broad ... dis 35 %
Table Butts, Back Flaps, &c ... dis 30 %
Inside Blind, Regular ... dis 30 %
" Light ... dis 40 %
Loose Pin. Wrt ... dis 35 %
Am. Spiral Spring Butt Co. list May 1st ... dis 25 %
Union Spring ... dis 20 %
Blind Butts, Parker ... dis 65 %
" Palmer ... dis 40 %
" Seymour ... dis 55&10 %
" Shepard ... dis 60 @ 60&10 %
" Lull & Porter ... dis 60 %
" Nicholson ... dis 45&10 %
" Huffer ... dis 33⅓&10 %
" Garretson, No. 1 ... dis 65 %
" Clark's, Nos. 1, 3 and 5 ... dis 65 %
" Clark's No. 2 ... dis 65&10 %
" " Nos. 2 4. 4½, 6, 8, 10 ... dis 45 %

Can Opener.
Messenger's Comet ... per doz $3·00 dis 20 %
American ... per doz 2·25 dis 40 %
Lyman's ... per doz 3·75 dis 20 %
No. 4, French ... per doz 2·25 dis 40 %
No. 5, Iron Handle ... per doz 2·25 dis 40 %
Sprague's ... Nos. 1 2 3 4
Per doz $4·00 4·50 5·00 9·00 dis 55&10 %
Star ... per doz $5·00 dis 20&10 %
Eureka ... per doz $3·50 net
Sardine Scissors ... per doz $7·00 dis 40 %
Caps—Percussion, per 1000.
G. D ... 37 @ 40c
Ely's E. B ... 1-4s. 58c.; 1-10s. 70c. gold
" Double Waterproof, 1-4s, $1·45; 1-10s, $1·52½c., gold
Colt's ... 1-10s 80c gold
Carpet Sweepers.
Union ... each $2 75 net
Welcome ... each 2 75 net
Cartridges.—Metallic ... dis 55&5 %
Cards.—Horse and Curry ... dis 30&10 %
Cotton ... dis 10&10 %
Wool ... dis 15&10 %
Carpet Stretchers.
Cast Steel, Polished ... per doz $3·00 dis 30 %
Cast Iron, Steel Points ... per doz $2·00 dis 45&5 %
Castors.
Bed ... dis 30&10 @ 40 %
Plate and Shallow Socket ... dis 40&10 %
Deep Socket ... dis 35 @ 40 %
Cattle Leaders ... new list dis 60&10 %
Chain.
English Coil ... net gold
⅌ ℔ ... 11¼ 8¾ 7½ 7¼ 7¼ 7c
3-16 ¼ 5-16 ⅜ 7-16 ½
Trace, 6½-10-2 ... by the cask, ⅌ pair, gold 55c
Trace, 7-10-2 ... by the cask, ⅌ pair gold, 62c
German Halter Chain ... dis 25 % gold
German Coil ... dis 25 % gold
Galvanized Pump Chain ... ⅌ ℔ 13c
Jack Chain, Iron ... dis 50&10 %
" Brass ... dis 40&10 %
Chalk.
White ... ⅌ gross, 57c net
Red ... ⅌ gross, 90c net
Blue ... ⅌ gross, $1·00 net
White Crayons ... ⅌ gross, 16½c net
Chisels.
Socket Framing, Douglass, Extra ... dis 60&10&10 %
" " Crossman ... dis 50&15&10 %
" " Buck Bros. equivalent to dis 50&17½ %
" " Hart Mfg. Co ... dis 60&10 %
" " Merrill ... dis 60&10 %
" Firmers, Douglass, Extra ... dis 60&10 %
" " Crossman ... dis 50&10&10 %
" " Buck Bros ... equivalent to dis 50&15 %
" " Hart Mfg. Co ... dis 60&5 %
" " Merrill ... dis 60 %
Socket Corner ... dis 60&10 %
Tanged Firmers ... dis 40&10 %
" " Butcher's ... $5·50 to £ gold
" " Newbould's ... $5·50 to £ gold
" " Spear & Jackson's ... $5·50 to £ gold
" " Buck Bros (Shank) ... $5·50 to £ gold
Clamps.
Cabinet ... dis 60&10 %
Gray's ... dis 20 %
Lambert's ... dis 20 %
Providence Tool Co ... dis 10 %
Clips, Axle.
Norway or Best ... dis 40 %
Superior ... dis 50 %
"Star," Superior Philadelphia ... dis 45&5 %
Coal Shovels.

	Nos.	1	2	
Wrought Iron.				
Long Wrt. H'dles ... per gross,		$15·00	18·00	dis 25 %
Short " "		12·00	14·00	dis 25 %
Wood Handles	"	12·00	14·00	dis 25 %
Gem (Edgar's Pat.)	"	15·00	18·00	dis 25 @ 30 %

Cast Iron, Iron Handle ... per doz, 75 @ 80c. net
" Wood Handle ... per doz, $1·00 net
Coal Hods.

	Inch. 14	15	16	17	18	
Regular, Jap'd ... per doz,	$12·00	12·75	13·50	15·50	18·00	dis 60&10 %
Regular, Gal'd ... "	15·00	16·00	17·50	19·50	22·50	dis 50&10 %
Ladies' Favorite, Jap'd. ⅌ doz	15·00	16·00	18·00	20·00		dis 50 %
Ladies' Favorite, Galvanized ... "	19·00	21·00	22·00	25·00		dis 45 %

Funnel Hods.—	Nos. 15	16	17	
Oriental, Japanned. ⅌ doz.	$16·50	18·00	20·00	dis 50 %
" Galvanized	21·50	22·50	24·00	dis 40 %
Morning Glory, Jap'd. "	16·50	18·00	20·00	dis 50 %
" " Gal'd. "	21·00	22·50	24·00	dis 40 %
Iron Clad, Jap'd ... "		21·50		dis 60&10 %
" " Gal'd ... "		22·50		dis 50&10 %

Sidney Shepard & Co.'s new list ... dis 10 %
Cockeyes ... 1¼ in., 28c.; 1½ in., 33c.; 1¾ in., 37c. net
Cocks.
Brass Racking ... dis 30&10 %
Lock and Globe ... dis 30&10 %
Lever Bibbs ... dis 20&10 %
Ale and Beer ... dis 25&10 %
Coffee Mills.
Board and Box ... dis 15 @ 20 %
Brighton ... dis 20 %
Increase Wilson's ... dis 20 %
Selsor's Pat ... $9·50, $10·50—dis 25 %
American (Enterprise Mfg. Co.) ... dis 20 %
French Steel ... dis 15 %
The Swift ... dis 20 %
Compasses and Dividers.
Bemis & Call Co.'s ... dis 35&10 %
Cook's ... dis 15 %
Excelsior ... dis 30 %
Peck Stow & Wilcox ... dis 25 %
Miller's Patent ... dis 25&10 %
Coopers' Tools.
Bradley's ... dis 15 @ 20 %
Chas. E. Little ... dis 20 @ 25 %
Swan & Brombacher ... dis 15 @ 20 %
Corkscrews ... dis 25 %
Corn Knives and Cutters.
Bradley's ... dis 10 %
Crow Bars.
Cast Steel ... ⅌ ℔ 11c. net
Iron, steel points ... ⅌ ℔ 5c
Crucibles.—Gautier & Co ... ⅌ No. 5½c
Curling Irons, &c.
⅛, ⅜, ¼ in., $1·80, $2·00, $2·40 ... dis 10 %
Curling Tongs ... ⅌ doz $6 50—dis 15 %
Pinching Irons ... ⅌ doz 7 50—dis 20 %
Curry Combs.
Hotchkiss' & Kellogg's, Iron & Brass, old list ... dis 40 %
Fitch's (List of No. 24, $1) ... dis 20&10 %
Rubber ... ⅌ doz, $9·00—dis 15 %
Wood Tooth (Fuller Bros.) ... per doz $2·25 net
Curtain Pins.—Silvered Glass ... new list dis 15 %
Cutlery.
American Table / American Pocket (Meriden Cutlery Co) ... New list Jan. '75, dis 25 % / dis 25 %
Am. Pocket—Humason & Beckley Mfg. Co ... dis 20&10 %
Am. Miller Bro.'s Cutlery Co ... dis 25 %
Naugatuck Cutlery Co ... dis 25 %
Dippers.
Britannia ... per doz 7·50—dis 30 %; by bbl. dis 33⅓ %
Cocoa, Plain ... per doz $3·25—dis 20 %
" Rimmed ... per doz 3·75—dis 20 %
Dog Collars.
Embossed Gilt ... dis 20 %
Leather ... dis 30 %
Brass ... dis 25 %
Door Springs.
Gem (V.W.&W.), No. 1 Large, Jap'd ... ⅌ doz $3·50 }
" " No. 2 Medium ... ⅌ doz 2·50 } dis 10 %
" " No. 3 Small ... ⅌ doz 2·00 }
Gray's (V.W.&W.) ... ⅌ doz 2·50 net
Torrey's Pattern (V.W.&W.) ... ⅌ doz $2·50 net
Torrey's Patent ... ⅌ doz $2·50 net
Johnson's ... per doz $3 00 net
Palladium ... 5 in., $5·00; 8 in., $7·00 dis 15 %
Gilmer's Japanned No. 6 ... ⅌ doz $5·00 }
" Coppered ... " 6·00 } dis 20 %
" Silvered ... " 8·00 }
Challenge.—Japanned ... No. 9, per doz $2·00 }
No. 7, " 2·50 } dis 10 %
No. 6, " 3·50 }
Barker's Concealed ... dis 12½ %
Drawing Knives.
Crossman's No. 1 ... dis 50&15&10 %
Douglass, Extra ... dis 60&10&10 %
Hart Mfg. Co., No. 1 ... dis 60 %
Merrill ... dis 60&10 %
Nobles Mfg. Co ... dis 15 %
Bradley's ... dis 25 %
Adjustable Handle ... dis 15 %
Drills and Drill Stocks.
Blacksmiths' ... each $2 60 net
" Self-Feeding ... each $8 00 net
Breast, P. S. & W ... dis 45 %
" Aiken's ... dis 25&10 %
" Hotchkiss ... dis 10 %
" Wilson's ... dis 10 %
" Miller's Falls ... dis 25 %
Ratchet, Merrill's ... dis 20 %
" Ingersoll's ... dis 35 %
" Whitney's ... dis 20 %
" Weston's ... dis 20 %
" Moore's Triple Action ... dis 20 @ 25 %
Wilson's Drill Stocks ... dis 20 %
Automatic Boring Tools ... each $2·75—dis 30 %

Drill Chucks.—The Danbury ... each 10·00, dis 20 @ 25 %
Beach Patent (Morse) ... dis 15 %
Egg Beaters.
Monroe's ... 8 in. 10 in.
Per doz $8·00 9·00 ... dis 10 %
Dover ... ⅌ doz $6·00—dis 10 %
National ... ⅌ doz $1·50—dis 20 %
Peerless ... ⅌ doz $ —net
Emery.
Genuine Chester—Regular Nos ... ⅌ ℔ 6c }
" Flour and FF ... ⅌ ℔ 4c } dis 10 %
Washington Mills—Regular Nos ... ⅌ ℔ 6c
" Flour ... ⅌ ℔ 5c
Enameled and Tinned Ware.
Kettles ... dis 30 @ 10 %
Sauce Pans ... dis 25 %
Glue Kettles ... dis 25 %
Tinned Saucepans ... dis 25 %
Escutcheons.
Door Lock ... Same discounts as Door Locks
Brass Thread ... dis 60&10 %
Wood ... dis 25 %
Faucets.
Fenn's ... dis 50 %
" Cork Stops ... dis 40 %
Star ... dis 55&10 %
Frary's Patent Petroleum ... dis 15&10 %
Taylor's Pattern " ... dis 20&10 %
Wood and Metallic ... dis 40 %
Wood, Cork Lined ... dis 65 @ 65&5 %
Enterprise Mfg. Co., Self-Measuring ... dis 20 %
Felloe Plates ... ⅌ ℔ 15c; dis 25&10 %
Files.
American File Co ... $5 00 to £ currency—dis 20 %
Arcade File Works ... $5·00 to £ currency
Auburn File Works ... $5.00 to £ currency
Nicholson ... new list, Jan. 1, 1875, net @ 5 %
Hartford File Co ... $5 50 to £ currency—dis 10 %
L. B. Heller & Co ... $5 00 to £ currency
Heller & Bros ... $5 00 to £ currency
"Western" ... 5 00 to £ net
Wheeler, Clemson & Co ... $5 00 to £ currency
Rothery's ... $5 to £ currency
J. & Riley Carr ... 5 25 to £ gold
" Horse Rasps ... 5 50 to £ gold
Stubs' ... 5 50 @ 9 00 to £ gold
Butcher's ... 5 25 to £ gold
Walter Spencer & Co.'s "Diamond" ... 5 00 to £ gold
Spear & Jackson's ... 5 00 to £ gold
Jowitt's ... 4 50 to £ gold
Newbould's ... 5 25 to £ gold
W. K. & C. Peace's "Imperial" ... 5 25 to £ gold
R. Ibbotson ... 5 00 to £ gold
Turton Bros. & Matthews ... $5 50 to £ currency
Fisher's ... 4 75 to £ gold
Goodlad's ... 4 00 to £ gold
Moss & Gamble ... 5 25 @ 5 50 to £ gold
Thos. Turner & Co. (Peter A. Frasse & Co.) 5 00 to £ gold
" Horse Rasps ... 5 25 to £ gold
"Philo Sheffield," P. T. Co ... 5 00 to £ gold
Limet & Co. (French) ... 5 00 to £ gold
Fluting Machines.
Mrs. Coles' Pony. 4 in., $4·75; 5 in., $5; 6 in., 5·50; 7 in., $6
Knox with 4-inch Rolls ... 3 80 each net
" " 6 " ... 4 30 each net
" " 8 " ... 6 75 each net
O. K ... 6 50 each net
Peerless, 4-inch Rolls ... 4 00 each net
" 5 " ... 4 75 each net
Excelsior, No. 1 ... 4 75 each net
" No. 2 ... 6 50 each net
Diamond ... 7 50 each net
Champion, 6 inch rolls ... 6 00 each net
" 4 inch rolls ... 5 00 each net
Climax 7-inch Rolls ... 8 00 each net
" 4½ " ... 6 50 each net
Empire ... 4 00 each net
Eureka, No. 1, 7-inch Roll ... 8 00 each net
" No. 2, 5-inch Roll ... 6 00 each net
Defiance ... 4 in., $5·50; 6 in., $4·00; 8 in., $6·50 each net
K. F. M., 4½-inch Roll ... 5 50 each dis 15 %
" 6-inch Roll ... 6 00 each dis 15 %
Myers Fashion Fluter, 4½-inch Rolls ... 2 75 each net
" Convex Brass Fluter, Sad Iron attachment ... per doz $15·00
Domestic Fluter ... $1·50 each net
Geneva Hand Fluter ... $15 00 per doz net
Fluting Scissors ... dis 25&10 %
Forges.
"Empire" (W. P. Kellogg & Co.) ... dis 20 %
Forks.
Hay, Manure & Spading ... dis 33⅓ %
Plated A 1 ... dis 50 %
Fry Pans.
Burnished, P. S. & W., new list ... dis 50 %
⅌ doz ... $3·00 3·75 4·25 4·75 5·25 6·00 7·00 8·00 9·00
No ... 0 1 2 3 4 5 6 7 8
Smith, Burns & Co., "Excelsior" Polished ... dis 35 %
⅌ doz ... $3·70 4·00 4·70 5·30 6·00 7·00 8·00 9·00
No ... 1 2 3 5 6 7 8
Gas Stoves.
Tifft & Howard ... dis 20 %
Gauges.
Marking ... dis 45&10 %
Wire ... dis 10 %
" Smith's Patent ... per doz $18·00, dis 40 %
Gimlets.
Nail and Spike ... dis 25&10 %
Double Cut, Shepardson's ... dis 20 %
" " Hartwell's ... dis 40 %
" " Ives' ... dis 25 %
" " Douglass' ... dis 20&10 %
Glue Pots.
Tinned and Enameled ... dis 25 %
Family, Howe's "Eureka" ... dis 25 %
" L. E. & C.'s "Handy" ... dis 25 %
Grind Stone Fixtures.
Sargent's Patent ... dis 65&10 %
Reading Hardware Co ... dis 70 %
J. F. Green & Bro ... dis 20 %
Hart Mfg. Co.'s ... dis 60&25&10 %
Rick Bros ... dis 45&5 %
Hammers.
Emmet Hammer Co.'s Handled ... dis 25 %
" " Sledge & Stone. ⅌ ℔ 40c.; dis 40 %
Humason & Beckley Mfg. Co ... dis 16⅔&10 %
Maydole's ... dis 12 %
Cheney's ... net @ dis 5 %
Verree ... dis 5 %
Yerks & Plumb ... dis 20 %
Magnetic Tack ... dis 25&10 %
Warner & Noble's ... dis 10 %
Hand Cuffs and Leg Irons.
Tower's Hand Cuffs, $4 00 per pair ... } dis 25 %
" Leg Irons $6 50 per pair ... }
Providence Tool Co.'s Hand Cuffs $15 per doz } dis 10 %
" Leg Irons 25 " }
Handles.
Door or Thumb Latches—
Nos. 0 1 2 3 4
Per doz $0·80 1·00 1·13 1·35 1·50—dis 60 %
Roggin's Latches ... 40c. @ 50c. net
Bronzed Iron Drop Latches ... per doz $1·50 net
Wrought Chest ... dis 60&10 %
Surface Chest ... dis 65&10&10 %
Flush Chest ... dis 60&10&10 %
Lifting ... dis 60&10 %
Coffin ... dis 50&10 @ 60&10 %
Saw and Plane ... dis 25&10 %
Hammer and Hatchet ... dis 10 %
N. Carolina Handle Co ... dis 15 %
Brad Awl ... per gross $3 50—dis 20&10 %
Hickory Firmer Chisel, ass'td " 5 25—dis 20&10 %
" " " large " 6 50—dis 20&10 %
Apple " " ass'td " 6 00—dis 20&10 %
" " " large " 7 50—dis 20&10 %
Socket " " ass'td " 3 50—dis 20&10 %
" Framing " " 7 00—dis 20&10 %
File ... " " 4 00—dis 20&10 %
Auger ... " " 6 50—dis 20&10 %
" large " " 8 00—dis 20&10 %
Patent Auger, Ives' ... dis 25&10 %
" " Douglass' ... per set $1 25—dis 10 %
" " Swan's ... per set $1 00—dis 30&10 %
Hangers.
Barn Door ... dis 65&10 %
"Anti-Friction" No. 1, $1·25; No. 2, $1·50 per pair dis 40 %
Novelty ... dis 30 %
Challenge ... dis 40 %
Harness Snaps.
Henshaw's ... dis 25&10 %
Judd's ... dis 40 %
Fitch's (Bristol) ... dis 30 %
Hotchkiss' ... dis 10 %
Andrews' ... dis 25 %
Sargent's ... dis 50&10 %
New York Wire ... dis 20&20 %
Hatchets.—Isaiah Blood ... dis 15 %

	Nos.				
Shingling, Nos.	1 2 3	⅌ doz $7 25	8 00	8 75	
Claw,	" 1 2 3	⅌ doz 7 75	8 50	9 25	
Lathing,	" 1 2 3	⅌ doz 7 50	8 00	8 50	
Hunt's					dis 10 %
Shingling, Nos.	1 2 3	⅌ doz $7 25	8 00	8 75	
Claw,	" 1 2 3	⅌ doz 7 75	8 50	9 25	
Lathing,	" 1 2 3	⅌ doz 7 50	8 25	9 00	
Hurd's					dis 25 %
Shingling, Nos.	1 2 3	⅌ doz $8 00	8 50	9 00	
Claw,	" 1 2 3	⅌ doz 9 00	9 50	10 00	
Lathing,	" 1 2 3	⅌ doz 8 00	8 50	9 00	
Newark's Edge Tool Co.'s					dis 25 %
Shingling, Nos.	1 2 3	⅌ doz $6 50	7 00	7 50	
Claw,	" 1 2 3	⅌ doz 7 25	7 75	8 25	
Lathing,	" 1 2 3	⅌ doz 6 50	7 00	7 50	
Yerkes & Plumb					dis 20 %
Shingling, Nos.	1 2 3	⅌ doz $7 00	7 50	8 00	
Claw,	" 1 2 3	⅌ doz 7 50	8 00	8 50	
Lathing,	" 1 2 3	⅌ doz 7 00	7 50	8 00	
Simmon's					dis 15 %
Shingling, Nos.	0 1 2 3	⅌ doz $7 50 8 00	8 50	9 00	
Claw,	" 1 2 3	⅌ doz	9 00 9 50	10 00	
Lathing,	" 1 2 3	⅌ doz	8 00 8 50	9 00	
Broad,	" 1 2 3	⅌ doz	9 00 10 00	12 00	
"	" 4 5 6	⅌ doz	14 00 16 00	18 00	
"	" 7 8	⅌ doz	20 00 22 00		
Elephant					dis 30 %
Shingling, Nos.	1 2 3	⅌ doz $8 00	8 50	9 00	
Claw,	" 1 2 3	⅌ doz 9 00	9 50	10 00	
Lathing,	" 1 2 3	⅌ doz 8 00	8 50	9 00	
J. P. Verree & Co					dis 5 %
Shingling, Nos.	1 2 3	⅌ doz $7 00	7 50	8 00	
Claw,	" 1 2 3	⅌ doz 7 50	8 00	8 50	
Lathing,	" 1 2 3	⅌ doz 7 00	7 50	8 00	
Underhill's					dis 10 %
Shingling, Nos.	1 2 3	⅌ doz 7 25	8 00	8 75	
Claw	" 1 2 3	⅌ doz 7 75	8 50	9 25	
Lathing,	" 1 2 3	⅌ doz 12 00	11 00	13 00	
M. H. Jones & Co					dis 25 %
Shingling, Nos.	1 2 3	⅌ doz $8 00	8 50	9 00	
Claw,	" 1 2 3	⅌ doz 9 00	9 50	10 00	
Lathing,	" 1 2 3	⅌ doz 8 00	8 50	9 00	

Hay Knives.—"Lightning" ... per doz $10·00 net
Hinges.
Gate, Western ... ⅌ doz $6·25—dis 60&10 %
" N. E ... ⅌ doz 11·25—dis 6 &10&10 %
" N. Y. State ... ⅌ doz 7·20—dis 60&10 %
Rolled Plate ... dis 65&10 %
" Raised ... dis 65&10 %
Wrought Strap and T ... dis 33⅓&10&5 %
Providence Plate. { 6 and 8 in. 11c ⅌ ℔ / over 8 in. 9½c ⅌ ℔ } ... dis 30 %
Screw Hook and Strap ... { 8, 10, 12 in. 6¼c / 14 to 36 in. 5½c } ... net
Heavy Welded Hook ... { 8 to 12 in., 6¼c / 14 in. & up, 6c } ... net
Screw Hook and Eye ... { ⅜ to 1 in., 8¼c / ⅝ in. 9¾c / ½ in. 11½c } ... net
Hoes.
Solid Shank, C. S ... ⅌ doz $8 00—dis 35 %
Socket ... ⅌ doz 9 00—dis 35 %
Riveted Eye ... ⅌ doz 5 00—dis 35 %
Grub ... dis 25 %
Planters ... net @ dis 5 %
Scovill ... add 33⅓ %
Scovill Pattern ... net @ dis 5 %
Lane's C. S. Crescent, American Pattern ... list net
" " " Scovil Pattern ... add 10 %
Hooks.
Bird Cage ... dis 60&10 @ 70&10 %
Cotton ... dis 20 %
Belt ... dis 55 @ 60 %
Bench—Hotchkiss' $5 00 ⅌ doz ... dis 10 %
" Weston's No. 1, $6·00; No. 2, $7·00 per doz net
" McGill's ... $3 00 per doz, dis 10 %
" Skinner's ... per doz $6·25, dis 20 %
Clothes Line, Harness, Wardrobe, Hat and Coat, Ceiling ... Hart's list ... dis 60&10&10 %
Sargent's list ... dis 60&5&10 %
Reading list ... dis 35&10 %
Wrought Staples and Hooks and Staples ... dis 70&10 %
Wire Screw Hooks and Eyes ... dis 65&10&10 %
Grass ... dis 20 %
Whiffletree—Patent ... dis 35 %
Hooks and Eyes—Malleable Iron ... dis 60&10&10 %
" " Brass ... dis 60&10 %

Horse Nails.

	Nos.	5	6	7	8	9	10
American Pressed ... ⅌ ℔		23c	20c	20c	20c	20c	20c
Ausable	"	30c	27c	25c	24c	25c	22c
" P't'd & Pol'd	"	31c	28c	26c	25c	24c	23c
" " & Blued	"	32c	29c	27c	26c	25c	24c
Cortland	"	29c	26c	24c	23c	22c	21c
Buffalo Forged	"	31c	28c	26c	25c	24c	23c
Globe, P't'd & Pol'd	"	31c	28c	26c	25c	24c	23c
National, Pointed and Polished, Pat. Fin	"	28c	25c	23c	22c	21c	20c
National, Pointed and Polished, Ex. Fin	"	30c	27c	25c	24c	23c	22c
Perkins' Pointed and Polished	"	30c	27c	25c	24c	23c	21c
Perkins' Pointed and Blued	"	31c	28c	26c	25c	24c	22c
Putnam	"	32c	28c	26c	25c	24c	23c
Vulcan, P't'd & Blued	"	33c	30c	28c	27c	26c	25c

Star Brand, 16c.; Morgan ... 14c
Putnam ... 3000 lbs., dis 5 %
Ausable, Am. Pressed, Perkins, Globe, National and New London ... 1000 lbs., dis 5 %
Vulcan ... 1000 lbs., dis 7½ %
Vulcan and Brundage ... 500 lbs., dis 5 %
Horse Shoes.
Burden ... ⅌ keg, $5·12½
R. I. Horse Shoe Co., Perkins Pattern ... ⅌ keg, 5·12½
" " R. I. Pattern ... ⅌ keg, 5·87½
Mule Shoes ... ⅌ keg, 6·12½
Perkins' Snow ... ⅌ keg, 6·62½
Boston Rolling Mills Hand Made ... ⅌ ℔ 8c
Kettles.
Brass ... ⅌ ℔ 45c net
Enameled ... dis 30 @ 40 %
Knives.
Ames' Butcher Knives ... dis 20 %
" Shoe " ... dis 15 %
" Bread " ... ⅌ doz $1·50—dis 15 %
Hay and Straw, "Wadsworth's" ... dis 20 %
Table and Pocket ... See Cutlery
Knobs.
Carriage (Jap'd 8 cents per gross) ... dis 60&10 %
Base—Common ... net
" Plush Tip ... dis 10 %
" Elastic End, No. 8 ... dis 40&10 %
Door, Mineral ... ⅌ doz $2·25 }
" Por. Jap'd ... ⅌ doz 3·00 } ... dis 40&5 %
" " Plated ... ⅌ doz 7·00 } & 2 % for cash
" " Por ... ⅌ doz 7·50 }
Furniture, Plain ... 75c gross inch, dis 10 %
Ladles.
Melting, Hart's ... dis 55&10 %
" Sargent's ... dis 50&10 %
" Reading ... dis 15&10 %
" Monroe's Patent ... per doz $4·00 dis 20 %
Lanterns.
Tubular ... No. 0, $11·00; No. 1, $14·00 net
Peerless ... No. 5, per doz $11·75—dis 10&10 %
Brady's Patent ... dis 10 & 10 %
Ætna ... dis 10 & 10 %
Yankee ... dis 10 & 10 %
De Beque ... dis 10 & 10 %
Lard Presses.
Draw Cut, 14 inch ... each $65 00—dis 20 %
Lemon Squeezers.
Porcelain Lined ... per doz $7 00, dis 15 %
Eureka, Tinned ... per doz, $ 0·00 dis 10 %
Dunlap's Improved ... per doz $6·00 net
Lines.
Linen Fish ... dis 20 %
Cotton Chalk ... dis 40 @ 45 %
Sil. Lake Chalk ... Nos. 0, 1, 2, 3, $6, 6·50, 7, 7·50, dis 20 %
Mason's ... dis 20 %
Locks and Latches.
Cabinet—Gaylord ... dis 25 %
" Eagle ... dis 25 %
Trunk " ... dis 25 %
Langstroth & Crane, Round Key ... dis 40 %
" " Flat Key ... dis 33⅓ %
Barnes & Deitz, Flat Key ... dis 25 %
Yale Lock Co., Flat Key ... dis 40 %
Sargent & Greenleaf, Flat Key ... dis 20 %
Continental ... dis 20 %
Shepardson's ... dis 20 %
American Lock Co ... dis 33⅓ %
Plate ... new list dis 40&2 %
Trenton, Branford, Norwich, Russell & Erwin, Norwalk, Nashua, Mallory, Wheeler & Co., P. & F. Corbin, Parker & Whipple, Jacobus & Nimick Mfg. Co ... dis 40&5 % ... and 2 % for cash
Padlocks, Russell & Erwin ... } dis 40&5 %
" Mallory, Wheeler & Co ... } and 2 % for cash
" Wm. Wilcox & Co ... }
" Romer's ... dis 5 %
" Vulcan Hardware Co ... dis 20 %
" New York Lock Co ... dis 20 %
" J. H. McWilliams ... dis 5 %
" Scandinavian Jail ... dis 10 @ 15 %
" Barnes & Deitz ... dis 25 %
" D. K. Miller Lock Co ... dis 30 %
" Penn Lock Works ... dis 20 %
Mallets.—Hickory and Lignumvitæ ... dis 20 %
Meat Cutters.
Dixon's (P. S. & W.). Nos. 1 2 3 4
⅌ doz. $14 00 $17 00 $19 00 $30 00 dis 25 %
Miles Challenge ... Nos. 1 2 3
⅌ doz. $22·00 $30·00 $40 00—dis 30 %
Perry's (P. S. & W.) ... Nos. 200 300 400
⅌ doz. $22·00 $27·00 $40·00—dis 25 %
Woodruff's (P. S. & W.) ... Nos. 100 150
⅌ doz. $15·00 $18·00—dis 25 %
Hales' ... Nos. 11 12 13
⅌ doz. $27·00 $33·00 $42·00—dis 35&2 %
Draw Cut ... Nos. 5 6 7
Each $56·00 $90·00 $250 00—dis 20 %
American ... dis 25 @ 25&5 %
No ... 1 2 2½ 3 4 B 5
Each ... $6·00 $9·00 $12·00 $15·00 $30·00 $60·00 $75·00
Molasses Gates.
Stebbins' ... dis 62½&10 %
" Tinned ends ... dis 40&10 %
Bush's ... dis 20 %
Lincoln's ... dis 50&10 %
Weed's ... dis 15 %
Mortars and Pestles.
Iron ... net
Nail Pullers.
Taft's ... per doz $24·00 net
Nails ... 10d., $3·10 @ $3·15 net
Nuts and Washers.
Nuts ... large, 6c; small, 8c off list.
Washers ... large, 8½c: small, 10½c off list.
Oilers.
Miller's Zinc, Brass and Copper ... dis 40 %
Sheet Metal Screw, Zinc, Brass and Copper ... dis 40 %
Olmsted's ... dis 25&10 %
Broughton's ... dis 25&10 %
Malleable ... per doz $5 00 dis 10 %
Prior's Patent or "Paragon" ... dis 40 %
Ox Shoes.
Concave ... ⅌ ℔ 13c net
Ox Balls ... dis 60&10 %
Pencils.
Faber's Carpenters' ... net
" Round Gilt ... ⅌ gross $6 00 net
Dixon's Lead ... ⅌ gross $4·50 net
" Lumber ... ⅌ gross 9·00 net
Picture Nails and Knobs.
Brass Head ... dis 60&10 %
Porcelain Head ... dis 55&10 %
Richards' Patent ... dis 40 @ 40&10 %
Judd's ... dis 60&10 %
Pinking Irons ... per doz $2 75—dis 65 %
Planes and Plane Irons.
First Quality ... dis 35 %
Second Quality ... dis 50 %
Bailey's Patent Adjustable ... dis 25&10 %
Plane Irons, Butcher's ... $5 50 to £ gold—new list
" Buck Bros ... $5 50 to £ gold
" Bailey's Patent ... dis 25&10 %
" Auburn Tool Co.'s ... dis 25 %
" Greenfield Tool Co ... net list
" Middletown Tool Co ... net list
" Ohio Tool Co ... dis 10 %
" Spear & Jackson's ... 5 50 to £ gold—new list
" Sandusky Tool Co ... dis 10 %
Plow Bits, Greenfield Tool Co ... dis 10 %
Pliers and Nippers.
Button's Patent ... dis 33⅓ %
Hull's Patent Nippers, No. 1, $15; No. 2, $21 ⅌ doz dis 25 %
Leach's Patent Wire Cutters ... per doz $6 50—dis 15 %
Gas Pliers ... dis 25 %
Plumbs and Levels.
Stanley R. & L. Co.'s Pat. Adjustable ... dis 65&10 %
" " Non-Adjustable ... dis 65&10 %
Chapin's ... dis 66⅔&10 %
Standard Rule Co.'s New Adjustable ... dis 60&10 %
Standard Rule Co.'s Non-Adjustable ... dis 60&10&10 %
Pocket Levels ... dis 50&10 %
Johnson's Patent Adjustable ... dis 60&10 %
Pulleys.
Hot House and Tackle ... dis 60&10 %
Jap'd Screw ... dis 60&10 %
Brass Screw ... dis 60&10 %
Jap'd Side ... dis 60&10 %
" Clothes Line ... dis 60&10 %
Hay Fork ... per doz $4 50 @ 5 00, dis 10 %
Pumps.
Douglas Cistern, etc ... new list dis 25 %
" S. & F ... new list dis 20 %
Union Mfg. Co's. Cistern and Pitcher ... dis 25 %
" " " Rams ... dis 20 %
" " " Garden Engines ... dis 10 %
Cucumber (Burlingham & Purdy)—
6 ft. No. 3, with 12 ft. pipe ... $4·00 net
ft. No. 1, with 12 ft. pipe ... 4·50 net
From 6 to 36 ft. add 20 cents per ft.
Pipe, 8c. per ft.; Coupling, 20c. per ft.
Punches.
Belt or Drive ... per doz $1·50 net
Spring ... per doz $6·50—dis 20&10 %
Rail.
Sliding Door, Wrought Brass ... ⅌ ℔ 44c., dis 10 %
" " Iron, Painted ... ⅌ foot 9c—dis 55&10 %
Barn Door, ⅝, ⅞ and ¾ inch ... dis 60&10&10 %
" " for N. E. Hangers ... dis 60&10&10 %
Rakes.
Cast Steel ... dis 35 %
$8 00 9 00 10 00 11 00
8 10 12 14 teeth.
Malleable ... dis 35 %
$5 00 5 50 6 00 6 50
9 11 13 15 teeth.
Razor Straps.
Evan's ... dis 25&10 %
Genuine Emerson (B. F. Badger or C. Emerson) ... dis 25 %
Imitation Emerson ... ⅌ doz $2·75—dis 40 %
Hunt's ... dis 40 %
Chapman ... dis 10 @ 15 %
Torrey's ... dis 10&10 %
Saunder's ... net @ 10 %
Rivets.—Old Colony.
Iron and Tinned ... dis 25&7½ %
In bulk ... dis 7½ %
Copper Rivets and Burrs ... dis 20 %
Nos. 7 8 9 10 11 12 13 14 15
Per lb. 49c 50c 52c 54c 56c 58c 60c 65c 70c
Rivet Sets ... dis 5 @ 10 %
Rods.
Stair ... dis 40 %
" American Patent ... dis 33⅓ %
Rollers.
Barn Door ... revised list dis 60, 10&10 %
Novelty ... dis 10 %
Rope. Manufacturers' List of Sept. 28, 1875.
Manila ... ½ inch and larger ⅌ ℔ 14½c
" ... ⅜ inch ⅌ ℔ 15 c
" ... ¼ and 5-16 inch ⅌ ℔ 15½c
Manila Lath Yarn and Tar'd Rope ... ⅌ ℔ 14 c
" Hay Rope ... ⅌ ℔ 15 c
Sisal ... ½ inch and larger ⅌ ℔ 11½c
" ... ⅜ inch ⅌ ℔ 12 c
Sisal ... ¼ and 5-16 inch ⅌ ℔ 12½c
" Hay Rope ... ⅌ ℔ 12 c
Rules.

	Boxwood.	Ivory.
Chapin's	dis 66⅔&10 %	dis 50&10 %
Stanley	dis 70 %	dis 55 %
Standard	dis 70 %	dis 50&10 %
Stephens'	dis 70&10 %	dis 55&10 %

Sad Irons.
From 4 to 10 lbs ... ⅌ ℔ 3¼ @ 3¾c net
Sad Iron, Nickel Stand attached ... ⅌ ℔ 9c
Self-Heating ... per doz $10 00 net
" " Tailors' ... per doz 22 50 net
Sand Paper.
Beader & Adamson's Flint, 00 to 1½ ... $4 25 ⅌ ream }
" " " 2, 2½ & 3. 4 75 " }
" " " Assorted. 4 25 " } dis 15 %
" " Star ... ⅌ ream $3 25 }
" " Emery ... ⅌ ream $6 50 @ 11 50 }
New England, same list as B. & A. Flint ... dis 15 %
H. B. & M. Roman Flint " " " ... dis 15 %
Sash Cord.
Common ... ⅌ ℔ 18 @ 20c. net
Patent ... ⅌ ℔ 24c. net
Silver Lake, Russia Flax ... ⅌ ℔ 55c }
" " White Cotton ... ⅌ ℔ 55c } net
" " Drab Cotton ... ⅌ ℔ 60c }
Raw Hide ... dis 15 %
Sash Locks.
Clark's, Nos. 1 and 2, $10·00 per gross ... dis 33⅓ %
Ferguson's ... dis 33⅓ %
Norwich ... dis 25 %
Walker's ... dis 10 %
New England ... dis 20 %
Sash Weights.—Solid Eyes ... ⅌ ℔ 2c
Sausage Stuffers or Fillers.
Miles ... ⅌ doz $20—dis 30 %
Stow or Perry ... ⅌ doz No. 1, $15; No. 0, $21—dis 25 %
Draw Cut No. 4 ... each $30 00—dis 20 %
Saw Frames ... per gross $18 00—dis 15&10 %
Saw Rods ... $10 list, dis 10&10 %
Saws.
Spear & Jackson's old pattern ... $4 50 to £ gold
Spear & Jackson's American Pattern ... $3·55 to £ gold
John Spear ... $3 60 to £ gold
Am. Saw Co ... new list
Perforated Cross Cuts, all kinds ... 68c ⅌ foot
Inserted Tooth ... dis 10 %
All else ... dis 12½ %
Disston's Circular ... dis 20 %
" Mill ... dis 25 %
" Cross Cut ... dis 15 %
" other kinds ... dis 12½ %
H. W. Peace's Circulars ... dis 25 %
" Other kinds ... dis 20 %
Wm. McNiece's Hand, Cross Cut and Circular ... new list dis 15 %
Wm. McNeice's Patent Pole Pruning Saw ... dis 10 %
" " Compass Saw ... net.
E. M. Boynton's Lightning ... dis 40 %
" Others ... dis 15 %
Wheeler & Clemson Mfg. Co.'s Hand ... dis 15 %
" " Cross-Cut ... dis 30 %
Livingston's Butcher and Kitchen ... dis 15 %
Livingston's Framed Wood—
Nos. 101 102 103 105 106
Per doz $12·00 10·00 12·00 8·00 7·00 dis 5 %
Saw Sets.
Stillman's Genuine ... ⅌ doz $5·00—dis 10 %
" Imitation ... ⅌ doz 3·25—dis 20 %
Common Lever ... per doz $2·00 dis 20 %
Leach's ... No. 0, $8·00; No. 1, $15·00 dis 15 %
Nash's ... No. 1, $8·50; No. 2, $5·50 dis 20&10 %
Hammer, Hotchkiss ... $5·50 dis 10 %
" Bemis & Call's ... dis 20 %
" Aiken's Genuine ... $15·00 dis 25&10 %
" " Imitation ... $7·00 dis 25&10 %
Boynton's ... per doz $12·00 dis 30 %
Scales.
Hatch, Counter ... ⅌ doz $36—dis 25 %
" Tea ... ⅌ doz $15—dis 25 @ 30 %
Union Platform ... $6·00, $7·50—dis 40 %
Turnbull's ... dis 15 @ 20 %
Brown's ... dis 25&5 %
Fairbanks' ... new list dis 15 @ 20 %
Howe's ... dis 15&5 %
Chatillon's Grocers' ... dis 25 %
" Eureka ... dis 20 %
Universal Family ... dis 25 %
Scale Beams.
No. 1 300 to 1200 lbs ... 90c ⅌ cwt }
No. 2 " " ... 75c ⅌ cwt } dis 35 @ 40 %
Scrapers.
Box, 1 Handle ... per doz $5·00, dis 10 %
" 2 " ... per doz 6·00, dis 10 %
Foot ... dis 60 & 10 %
Ship (common) ... per doz $3 00 net
Ship—Providence Tool Co ... dis 10 %
Screw Drivers.
Hart, Bliven & Mead ... dis 55&10 %
Douglass Mfg. Co ... dis 25&10 %
" " No. 1 ... dis 20&10 %
Disston's ... dis 40&10 %
Screws.
Flat Head Iron, List of September 1, 1875 ... dis 30 %
Round Head Iron " " " ... dis 20 %
Flat Head Brass " " " ... dis 30 %
Round Head Brass " " " ... dis 20 %
Round Head Silver Capped, List March 1 ... dis 25 %
Hand Rail ... dis 55&10 %
Coach or Lag ... dis 30&10 @ 40 %
Coach, Patent Gimlet Point, List Jan. 1, 1875 ... dis 35 %
Bed ... list net
Japanned, List of Sept. 1, 1875 ... Net
Machine—Flat Head, Iron, List Jan. 12, 1875 ... dis 25 %
" " Brass, " " ... dis 15 %
Round Head, Iron, " " ... dis 20 %
" " Brass, " " ... dis 10 %
English, Flat Head, Iron; American List, Sept. 1, 1875
Nettlefold & Chamberlain's ... dis 30&5 %
Birmingham Sc'w Co ... dis 30&5 %
Birmingham Screw Co., Brass ... dis 30&10 %
Bench—Iron ... dis 60, 10&10 %
" —Wood, Beach ... ⅌ doz $3·00 net
" " Hickory ... dis 20&10 %
Hand ... dis 25&10 %
Jack—Bell Bottom ... dis 15 %
Scythes.
Blood's German Steel, Grass ... ⅌ doz $10 00 }
" Cast " " ... ⅌ doz 11 00 }
" Silver " " ... ⅌ doz 12 00 }
" German " Grain ... ⅌ doz 14 00 } dis $1·50
" Cast " " ... ⅌ doz 15 00 } from list
" Excelsior and Granger ⅌ doz 11 00 }
" Young America ... 10 50 }
" Silver Clipper ... 13 00 }
Scythe Snaths ... dis 20 %
Sieves.—Mann's Patent ... New list net
14 16 18 20 24 30 mesh
Iron ... $3·00 3·00 3·25 3·50 3·75 4·75 ⅌ doz
Plated. 3·50 3·75 4·00 4·25 4·50 6·00
Wood Rims ... 18 mesh, $1·50 per doz, dis 10 %
Shears and Scissors.
Cast Steel ... dis 75&10 %
Cast Iron ... New list July 15 ... dis 30 %
Heinisch Sons' Trimmers and Scissors ... dis 65 %
" " Standard quality Shears and Trimmers ... dis 40 %
Seymour's Straight Trimmers ... dis 60&10 %
" Scissors ... dis 50 %
Pruning ... per doz $10 00—dis 35 %
Barnard's Lamp Trimmers ... per doz $3·75

Sheaves.
Sliding Door, M. W. & Co. list... dis 40&5&2 %
" R. & E. list... dis 50&5&2 %
" Patent Roller... dis 25 %
" " " Hatfield's... dis 50 %
" Russell's Anti-Friction... dis 50&2 %
Sliding Shutter, R & E. List... dis 50&5&2 %

Shovels and Spades.
Ames... dis 20 %
Birmingham Shovel Co... dis 15 %
Rowland's... dis 25 %
Old Colony... new list dis 10&5 %
Middleboro' Shovel Co... new list dis 20 %
C. E. Jennings... New list dis 30&10 %
Dunning s Shovels and Scoops... dis 20&7½ %

Shovels and Tongs.
Iron and Brass Head, R. & E. list... dis 50&10&2 %
" " Hart's... dis 55&2&10 %
Polished Steel... dis 50&10&2 %

Skates.
Barney & Berry's
N. Y. Club... ℔ pair $2·75
B. & B. Club... " 3·50
All Clamp... " 4·25
Rink... " 8·00 } dis 25 %
Florence Steel... $1·00 dis 25 %
" Spring... 3·00 dis 30 %
" All Clamp... 3·50 dis 30 %
Peck & Snyder's—
No. 1, Blued... per pair $5·00
No. 2, Nickel Plated... per pair 6·00
No. 3, " " extra... per pair 8·00
Clipper Club Blued... per pair 3·50
" " Full Pol'd... per pair 4·50
" " " and Nickel
Plated... per pair 6·00 } dis... 25 %
Acme Club Skates.—Nos. 5 7 10 12 14
Pair $4·00 5·00 7·00 7·50 8·00 dis 20 %

Slates.
Square Frames, Round Cornered, by case... dis 65&10 %
Less than a case... dis 65 %

Spoke Shaves.
Iron... dis 33⅓&10 %
Wood... dis 30 %
Bailey's... dis 20&10 %

Spoons.
Tinned Iron... dis 10 %
By the case... dis 20 %
Basting... dis 10 %
Britannia... C.! s50&5 @ 55 %
" Boardman's, new list... dis 55 %
Rogers & Bro., A 1... dis 50 %
Derby Silver Co... dis 50 & 5 %
Holmes, Booth & Haydens... dis 50 %
Nickel Silver Co... dis 40 %
German Silver... dis 30 @ 33⅓ %
Tin (P. S. & W.)—
Teas... $1·50 ℔ gross, net
Tables... 2·75 " net

Stocks and Dies... dis 5&10 %

Stone.
Hindostan Stone... ℔ ℔ 6c
" Axe Stone... ℔ ℔ 8c
" Slips... ℔ ℔ 10c } dis 20&10 %
Sand Stone... ℔ ℔ 6c—dis 20&10 %
Washita Stone... No. 1, ℔ ℔ 30c net
" ... No. 2, ℔ ℔ 25c net
" Slips... No. 1, ℔ ℔ 60c net
Arkansas Stone... No. 1, ℔ ℔ $1·35 net
" Slips... No. 1, ℔ ℔ $2·50 net
Grindstones. Family, J. F. Green & Bro... dis 20 %
" " Loring's... dis 10 %

Stove Polish.
Joseph Dixon's... ℔ gross, 6 00
Gem... ℔ gross $4·25 @ 4·50 net
Gold Medal... ℔ gross $6 00 dis 25 %

Squares.
Steel... dis 50 %; full cases, dis 50&10 %
Iron... dis 50 %; full cases, dis 50&10 %
Nickel Plated... add $2 50 @ $4 00 ℔ doz net
Try Squares and T Bevels... dis 45&10 %
Star Try Squares and Bevels... dis 30 %
Disston's Try Squares No. 1... dis 20 %
" " No. 2... dis 40 %
" " Improved... dis 20 %

Tacks.
Full Weight American Iron... dis 45&7½ %
Half Weight American Iron... dis 72½&7½ %
Carpet... dis 7½ %
Brads American Half Weight... dis 50&7½ %
Finishing Nails... ⅜ ½ ¾ 1 1¼ in. and over
℔ ℔... 25c 20c 18c 14c 12c dis 7½ %
Trunk and Clout... ⅜ ½ ¾ 1 1¼ in. and over
℔ ℔... 25c 20c 18c 14c 12c dis 7½ %
Copper Tacks... ℔ ℔ 50c—dis 7½ %
Iron Shoe Nails, ℔ ℔ 4-8 and longer, 9½c; 3½-8, 10c... dis 7½ %
Double Pointed... dis 33⅓&10 %

Tapes, Measuring.
American Flask and Cap Co... dis 20 %
Eddy's... dis 20 %

Tea Trays.
American Tea Tray Co... dis 15 %

Thermometers.
Tin Case... dis 50&10 %

Toe Calks.
Winsted... ℔ ℔ 13c., dis 10&10 %

Tobacco Cutters.
Enterprise Mfg. Co. (Champion)... dis 20 %
Wood Bottom... per doz $12—dis 25&10 %
All Iron... per doz $19·50—dis 25&10 %

Tinners' Tools and Machines.
P. S. & W... dis 10 %

Traps.
Game, Newhouse... dis 25 %
" Peck, Stow & Wilcox... dis 30 %
" Hotchkiss... old list dis 30 %; new list dis 10 %
" Blake's Patent... dis 30 %
Mouse, Wood Choker... ℔ doz holes. 15 @ 16c
" Patent Choker (Union Nut Co.)... ℔ doz holes 16 @ 18c net
" Round, Wire... ℔ doz $1 50 to 2 00 net
" Square, " ... ℔ doz 2 00 to 2 50 net
" Cage, " ... ℔ doz 2 50, dis 10 %

Trowels.
Lothrop's Brick and Plastering... dis 10 %
Disston's Brick and Plastering... dis 12½ %
Rose's Brick... dis 5 %
Brades' Brick... gold. dis 10 %
Worrall's Brick and Plastering... dis 20 %
Garden... dis 25 %

Triers.
Butter and Cheese... dis 25 %

Ventilators (Window).
Nickel and Gilt... per dozen $16·00 @ 18 00

Vises.
Trenton Vises, Solid Box.
40 to 160 lbs... 16c
160 and over... 20c
Peter Wright's... ℔ ℔ 15½c. @ 16c. gold
Wilson's Solid Box...
31 to 160 lbs... 18c
160 and upward... 22c
Wilson's Parallel... dis 30&10 %
Sargent's... dis 50&10&10 %
Backus & Union, Parallel... dis 25 %
Buffalo, Parallel... new list dis 25 %
Fisher & Norris' Double Screw Parallel... dis 15&10 %
Trenton Parallel... dis 15 %
Merrill's Parallel... dis 15 %
Parker's... dis 20 %
Stephens' Parallel... dis 15 @ 20 %
Bonney's Saw Filers... per doz $20—dis 20 %
Stearn's Saw Filers... per doz $20—dis 20 %

Wheel Barrows.
Canal (Pugsley & Chapman)... new list dis 15 %
Coal, Garden and Stone (Pugsley & Chapman)... dis 25 %

Well Wheels.
Revised list... dis 60&10 %

Wire.
Brass and Copper... dis 10 %
Bright and Annealed... Nos. 0 @ 18 dis 45 @ 47½ %
" " ... " 19 @ 26 dis 50 @ 52½ %
" " ... " 27 @ 36 dis 55 @ 57½ %
Coppered... " 0 @ 18 dis 40 @ 42½ %
Galvanized, Nos. 0 to 9... ℔ ℔ 8½ @ 9c net
Galvanized, Nos. 10 to 18... market list dis 10 @ 15 %
Tinned... dis 25 @ 30 %
Cast Steel... dis 15 @ 20 %
Tinned Broom Wire... dis 30 @ 35 %
Galvanized Telegraph, Nos. 8 and 9... ℔ ℔ 9c @ 9½c
Galvanized Telegraph, Nos. 10 and 11... ℔ ℔ 10c @ 10½c
" " 12... ℔ ℔ 10½c @ 11c
Annealed Fence, Nos. 8 and 9... dis 47½ @ 50 %
" Grape, " 10 to 14... dis 47½ @ 50 %
Fence Staples... ℔ ℔ 7½ @ 8 %
Stubs' Steel Wire... $7 00 to 8 gold
Judd's Picture Wire... dis 50
Clothes Line Wire... per coil 60c. net

Wrenches.
American Adjustable... dis 45 %
Baxter's Adjustable "S"... dis 20 %
" Diagonal... dis 20 %
Collins & Co.'s... dis 45 %
Coes' Genuine... dis 40&5 %
" Pattern (Wrought)... dis 50&10 %
" " (Malleable)... dis 65&10 %
Lindsay's Patent... dis 25 %
Taft's Pattern... dis 70&10 %
Davis Patent Duplex... new list dis 25 %
Bemis & Call's Patent Combination... dis 20&5 %
" " Merrick's Pattern... dis 25&2½ %
" " Brigg's Patent... dis 15&10 %
Aiken's Pocket (Bright)... per doz $10·00—dis 50&10 %

Wringers.

	Less than 2 doz	2 doz lots
Providence... ℔ doz	$77·00	$70·00
Reliance... ℔ doz	69·00	67·00
Universal—Extra... ℔ doz	72·00	70·00
Novelty... ℔ doz	78·00	70·00
Sherman... ℔ doz	72·00	70·00
Wringers without Cog Wheel... ℔ doz	60·00	58·00

TIN WARE AND TRIMMINGS.

STAMPED TIN WARE, dis 10 %.

COMMON STAMPED WARE, &C.

Bucket Covers.

Quarts	½	1	2	3	4
Inch	4⅞	5 3-16	6 5-16	6⅞	7 11-16
Per gross	$2·00	2·60	3·40	4·25	5·75
Quarts		6	8	10	12
Inch		8⅜	9⅛	9⅝	10 9-16
Per gross		$6·50	8·00	8·50	11·50

Cake Box Covers.

	Small.	Medium.	Large.
Inch	11½	12½	13½
Per gross	$15·00	18·00	22·00

Pot Covers.

Inch	7⅞	8⅛	8⅞	9⅛	9⅞	10½
Per gross	$5·75	6·00	6·25	6·75	7·25	8·25
Inch	10⅞	11⅛	11⅞	12⅛	12⅞	13½
Per gross	$8·75	9·50	10·00	13·00	13·75	14·50

Pie, Dinner or Scolloped Plates.

Inch	6	7	8	9	10	11
Per gross	$4·00	4·50	5·50	5·80	9·50	10·50

Deep Pie Plates.

Inch	9	10
Per gross	$9·50	10·50

Jelly Cake Pans.

Inch	9	10
Per gross	$7·50	10·00

Coffee Pot Covers.

Plain	1½	2	3	4	5	6 qts.
Inch	3	3⅜	3⅞	4½	5	
Per gross	$1·15	1·40	1·60	2·00	2·75	3·00
Rimmed	2⅞	3	3½	4	4½ inches.	
Per gross	$2·25	2·50	3·00	3·50	4·00	

T. K. Breasts only.

Inch	7½	8	8½	9	9½	10	10½	11	11½
Per gro.	$6·00	6·50	6·75	7·25	7·75	9·50	10·00	12·00	13·00

Grater Plates.

Sheet	⅛	¼	1
Per gross	$3·00	6·00	11·50

Scolloped Cake Pans.

	Small.	Large.
Without Tubes... per gross,	$8·00	11·50
With Tubes... "	10·50	14·00

Stamped Square Pans.

No	½	
Per gross	$7·50	14·50

Common Square Pans (One Sheet).
Per gross... $11·50

Milk Skimmers (Plain or Pierced).
Per gross... $4 00

Lettered Plates

Inch	5½	6
Per gross	$3·25	4·00

Steamer Bottoms.
Add $1 per gross, or 10c. per doz. to list of Pot Covers.

Tin Stove Pipe Rings.

Inch	4	4½	5	5½	6	7
Plain... per gro.	$4·00	4·50	5·00	5·50	6·00	7·00
Jap'd or Burn'd... "	6·00	6·50	7·00	8·00	9·50	10·00

Coffee Boiler Lips.

	Small.	Large.
To Rivet... per gross,	$0·80	1·10
To Solder... "	1·25	

STAMPED DEEP AND RETINNNED WARE,
Discount 20&10 %.

Plain Stamped Water Dippers.

	½ pint.	Pint.	Quart.	quarts.	2½ quarts.
Per doz	·90	1·15	1·50	1·85	2·50

Retinned Milk Pans.

Qts...	½	1	1½	2	3	4	5	6	8	10	12
℔ doz.	1·20	1·50	1·75	2·00	2·25	3·15	3·50	3·85	4·75	5·25	5·75

Dipper Bowls, Plain Stamped—
Pints... ½ 1 Quarts... 1 2 2½
Per doz. ·50 ·75 Per doz... 1·00 1·25 1·75

Dipper Bowls Retinned—
Pints... ½ ¾ 1 Quarts... 1 2 2½
Per doz. ·75 ·95 1·05 Per doz... 1·40 1·75 2·25

Pans.
Dish Pans, Retinned Deep—

Quarts	7	8	10	14	17	21	30
Per doz.	8·50	9·50	11·00	13·00	16·00	19·00	30·00

JAPANNED TIN WARE, dis 5 %.

Cannisters, Common... Pound ½ 1 2 3
Per gross $10·50 15·00 24·00 30·00
Canisters, Hinged... Pound 1 1½ 2 3 4
Per gross $19·00 25·00 32·00 37·00 42·00
Canisters, Square... Pound 2 4 6 8 12 16
Per doz $3·00 4·25 5·00 5·75 8·00 9·00
Candlesticks, Japanned... No. 1 2
Per gross $6·00 7·00
Cake Boxes, Round... per nest, $5·25
Square... per nest, 4·25
Chamber Pails, Japanned
Nos... 2 3 4 5
Green, per doz... $8·00 9·00 11·00 13·00
Oak " ... $9·00 11·00 12·00 13·50
Dust Pans, Corrugated... per gross, $22·00
Box Graters... per gross, $3·75
Molasses Cups... Pint ½ 1 2 4
Per gross $13·00 16·00 28·00 42·00
Lunch Boxes, per doz... 7 in $2·00; 8 in. $2 50
Pepper Boxes Japanned... ℔ gross small, $3·00; large, $4·00
Toy Banks, House... No. 1 2
Per gross $7·00 5·50
Toy Banks, Gothic... No. 1, $6·00, No. 2, 4·00 per gross
Toy Cups, Straight... No. 1 2 3
Per gross $3·75 3·25 2·75
Toy Cups, Flaring... No. 1, $4·25; 2, $3·75 ℔ gross
Toy Pails, Covered... No. 1, per gross $4·00
Toy Rattles... per gross, $2·00
Trunks, Wire Handled... per nest (5) $1·75
Spittoons, Tin... per gross, $27

PLANISHED TIN WARE, dis 20 %

Tea Pot Handles—P. S. & W... dis 20 %
Stow's Patent Hollow Tea Pot Handles.
No. 1, Small 4½ inches... per gross, $11·50
No. 2, Medium, 5½ " ... " 12·50
No. 3, Large, 6½ " ... " 13·50
No. 4, Ex. Large 7½ in., for Wash Pitchers &c... " 18·00
Solid Iron. Tin Tipped.
No. 10, Small, 4½ inches... per gross, $9·00
No. 15, Medium, 5½ " ... " 9·50
No. 20, Large, 6½ " ... " 10·75
Stow's Patent Hollow Tea Pot Handles, Adamantine Bronze—P. S. & W
No. 12, Bronzed and Tin-Tipped... per gross, $13·50
Saucepan Handles, Of Best Malleable Iron.
P. S. & W... dis 20 %
Japanned.
No. 1, 5½ inches long... per gross, $3·50
No. 2, 6 " ... " 3·75
No. 3, 6½ " ... " 4·00
No. 4, 7½ " ... " 4·25
No. 5, 8 " ... " 4·50
No. 6, 9 " ... " 4·75
Tinned.
No. 1, 5½ inches long... per gross, $4·25
No. 2, 6 " ... " 4·50
No. 3, 6½ " ... " 4·75
No. 4, 7½ " ... " 5·25
No. 5, 8 " ... " 5·50
No. 6, 9 " ... " 5·75
Japanned... per lb., ·16
Tinned... " ·20
Iron Kettle Ears (P., S. & W.)... dis 45 %
Half gross pairs in a package.
Tinned

Nos.	1	2	3	4	5	6	7	8
Per gross pairs	.88c	1·00	1·50	1·75	2·10	2·75	3·75	4·50

Black.

Nos.	1	2	3	4	5	6	7	8
Per gross pairs	.75c	88c	$1·35	1·50	1·75	2·25	2·75	4·00

Tinned Tea Kettle Ears.

Nos.	4	5	6
Per gross pairs	$1·75	2·10	2·75

Extra Heavy Tinned Kettle Ears—French Pattern.

Nos.	1	2	3	4	5	6	7
Per gross pairs	$1·00	1·25	1·50	1·75	2·00	2·50	3·00

Malleable Iron Kettle Ears for Coal Hods, &c.
P., S. & W... dis 20 %
No. 10 Small... ℔ ℔, Tinned 21c; Black, 16c
No. 20 Medium... ℔ ℔, " 20c; " 16c
No. 30 Large... ℔ ℔, " 20c; " 16c
No. 40 Extra Large... ℔ ℔, " 20c; " 16c
In cases of 100 lbs. each.
Milk Can or Boiler Handles—(P. S. & W.) 4½ in.. dis 25 %
Plain, 8c.; Japn'd, 9c.; Tinned, 15c. per lb.; Malleable Clips or Ears to match, Tinned... 20c per lb.
Toilet Ware Handles—4½ inches (P. S. & W.)... dis 35 %
Plain with drilled holes, per lb... 9c
Plain with Cast " " ... 8c
Plumbers' Scrapers—(P. S. & W)... dis 25 %
Extra quality, length 6 in., per doz... $4·00

METALS.

IRON.—DUTY Bars, 1 to 1½ cents per lb., Sheet, Band, Hoop and Scroll, 1½ to 1⅞ cents per lb. Provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Pig, $7 per ton; Polished Sheets, 3 cents per lb.; Wrought Scrap, $8 per ton; Cast Scrap, $6 per ton. Railroad, 70 cents per 100 lbs. Boiler and Plate, 1¼ cents per lb.

Pig Iron—AMERICAN.
Foundry No. 1... ℔ ton, $24 00 @
Foundry No. 2... " 22 00 @
Gray Forge... " 20 00 @ 21 00
SCOTCH.
Coltness... " 33 00
Glengarnock... " 32 00
Gartsherrie... " 32 50
Eglinton... " 29 50 @ 30 00

Bar Iron.
Am. Refined, at mill... 2·4c. @ 2·5c

Rails.
American, at works, currency... ℔ ton 45 00 @ 50 00
Old Rails... " 26 00

Scrap.
Wrought Scrap... " 31 00 @ 32 00

Bar Iron from Store.
Common Iron.
⅜ to 2 in. round and square... } ℔ ton $37 50
to 6 in. x ⅜ to 1 in... }
Refined Iron.
⅜ to 2 in round and square... } " 37 50 @ 60 00
1 to 6 in. x ⅜ to 1 in... }
1 to 6 in. x ¼ and 3-16... " 62 50 @ 65 00
Shafting Iron—2½ to 4 in... " 62 50 @ 75 30
Rods—3-16 to ⅝ round and square... " 110 00 @ 65 00
Bands... " 70 00 @ 72 50
Hoops—⅝ to 2 in... " 130 00 @ 80 00
Swedish Iron.
Ordinary sizes... " 130 00 @ 132 50
Plow size... "

Sheet Iron.

	Common American and English.	R. G. American.	R. G. English.
Nos. 10 to 20... ℔ ℔	4c	5c	5½c
21 to 24... "	4¼c	5¼c	5¾c
25 to 26... "	4⅜c	5⅜c	5⅞c
27...	4¾c	5⅝c	6c
28... "	5c	6c	6¼c

Galvanized, 14 to 20, prime, ℔ ℔ 8½c; 2d quality ℔ ℔ 7⅞c
" 21 to 24 " " 9¼c " " 8¼c
" 25 to 26 " " 10 c " " 9 c
" 27 " " 10⅜c " " 9⅞c
" 28 " " 11⅜c " " 10⅜c
Patent Polished... ℔ ℔ 14c
Russia, Nos. 8 to 16... " 15⅛c
" Stained, No. 1... " 14⅝c
Belgian... 10c
One piece Corrugated Sheet Iron Elbows.

CHARCOAL IRON.

½	5	5½	6	7 inch.
$2·50	3·50	4·50	5·25	6·50 per doz.

RUSSIA IRON.

4½	5	5½	6	7 inch.
$5·00	7·00	9·50	12·00	14·00 per doz.

COPPER—DUTY. Pig, Bar and Ingot, 5c.; old copper, 4 cents ℔ ℔; Manufactured (including all articles of which copper is a component of chief value) 45 % ad valorem.
American Ingot... ℔ ℔ 28¼ @ 28½c
English " ... "

SHEATHING, BRAZIERS COPPER, BOLTS, &C.
Braziers Copper, ordinary sizes, over 16 oz., per square foot... 31c. ℔ ℔
Braziers Copper, ordinary sizes, 16 oz. and over 12 oz., per square foot... 33c. "
Braziers' Copper, 12 oz. per square foot... 33c. "
Circles less than 84 inch in diameter... 34c ℔ ℔
Circles, 84 inch diameter and over... 37c. "
Segment and Pattern Sheets... 34c. "
Locomotive Fire Box Sheets... 31c. ℔ ℔
Sheathing Copper, over 12 oz. per sq. ft... 30c. "
" 12 oz. ℔ sq. ft. and lighter... 35c. "
Bolt Copper... 31c. "
Copper Bottoms, 38c. ℔ ℔... net
No Copper is Sheathing except 14x48 inches, and not to exceed 34 oz. to the square foot.

O'NEILL'S PATENT PLANISHED COPPER.
14x48.
14 and 16 oz. and heavier... 37c. By the case, 36c. ℔ ℔
12 oz. and lighter... 40c. " " 39c "
Boiler Sizes.
7 in., 14x52, 8 in., 14x56, 9 in., 14x60
14 and 16 oz. and heavier... 39c. By the case, 38c ℔ ℔
(And all sizes not over 20 inches wide.)
30x60
14 and 16 oz. and heavier... 41c. ℔ ℔
12 oz... 44c. "

TINNING.
14x48, by the case... 8c. ℔ sheet
14x48, less than case... 10c. "
Other sizes not larger than 30x60... 2½c. ℔ sq.
Larger than 30x60... 3c. "

Brass.
ROLLED AND IN SHEETS.
For the purchase of 100 pounds and over at one time
HIGH BRASS.
All Nos. to No. 8, and widths 14 in. and under... 30c
All Nos. to No. 8, inclusive, and widths over 14 to 0 in. inclusive... 33c
Over 0 in. to 30 in. inclusive... 36c
½c ℔ ℔ advance on each No. above No. 28 to 38, inclusive.
All Brass thinner than No. 38 is Platers' Brass at... 49c
Sheets 4x48 in., and all sheets cut to particular sizes and lengths... 36c
Printers' Rules... 40c
Sheets wider than 30 in. and under 40 in... 40c
" 40 in. and over... 42c
Circular sheets in diam. from 4 in. to 14 inclusive... 40c
" " " over 14 in. to 0 " ... 43c
" " " 0 in. to 30 " ... 46c
" " " 30 in. to 40 " ... 49c
" " " 40 in... 52c
LOW BRASS.
1c ℔ ℔ more than High Brass.
Gilding Metals, 7c ℔ ℔ more than High Brass.
Platers' or Gold Metal { In Bars... 42c
{ Sawed... 45c
FOR SLITTING: Metal in Width.
In. to ½ in., to No. 30, inclusive, 1c ℔ ℔ advance.
In. to 1 in., thinner than No. 30, c ℔ ℔ advance.
In. to ½ in., " " 30, 3c " "
½ in. and less to No. 30, c ℔ ℔ advance.
½ in. and less thinner than No. 30 5c ℔ ℔ advance.

BRASS AND COPPER WIRE
(Stub's Wire Gauge).

	High Brass.	Low Brass.	Gild'g and Cop'r
Nos. 0 to 20	33	37	43
Nos. 21, 22, 23	34	38	44
Nos. 24 and 25	35	39	45

Brass Rods, No. 8 and larger, 39c ℔ ℔, less 10 per cent. Wire straightened and cut, smaller than No. 8, special rates, not less than 6c ℔ ℔ advance.

FINE WIRE—NET PRICES.

	High Brass.	Low Brass.	Gild'g and Cop'r
No. 6	0·41	0·45	0·51
No. 7	0·44	0·48	0·54
No. 8	0·46	0·50	0·56
No. 9	0·48	0·52	0·58
No. 30	0·50	0·54	0·62
No. 31	0·52	0·56	0·66
No. 32	0·56	0·60	0·71
No. 33	0·60	0·64	0·81
No. 34	0·64	0·68	0·91
No. 35	0·69	0·78	1·03
No. 36	0·76	0·82	1·15
No. 37	0·98	0·98	1·28
No. 38	1·28	1·28	1·78

Ten cents per pound extra for Spooling.

MISCELLANEOUS.
Common Plain Brass Pail Ears... 33c net
Hose Pipes, 500 and over... 79c net
" under 500... 84c net
Door Rail... 44c—dis 10 %

TUBING
(Brown & Sharpe's Gauge.)
℔ ℔
Plain to No. 20, inclusive... $0·48
Nos. 21, 22, 23, 2c. advance on List for each No.
Nos. 24, 25, 26, 4c. " " "
Above No. 26 special rates.
Plain Tube, 1-4 inch... 64
" 3-16 " ... 1 49
" 1-8 " ... 1 74
All Mandrel-Drawn Tubes 5c. advance on List.
Fancy Tubing 4c. advance on List above Plain.
English, Scotch, and Extra Patterns Fancy Tubing to No. 20... 57
Tubing sawed or cut 2 to 4 ft. long, 2c. advance on List.
Add to two cents a half-cent for each additional cut ting under two feet.
Discount on the foregoing list, 10 per cent.

LEAD—DUTY: Pig $2 per 100 lbs.; old Lead, 1½ cent per lb.; Pipe and Sheet, 2½ cents per lb.
Spanish... 7c gold
German Refined... 6½c gold
English... 6⅞ @ 7c gold
American... 6 @ 6⅛c gold
Bar... dis 10 %... 8⅛c.
Pipe... dis 10 %... 9½c.
Tin Lined Pipe... dis 10 %... 16½c.
Sheet... dis 10 %... 9½c.
Shot... dis 10 %. Drop, 9½c. Buck, 10½c.

BABBITT METAL.
N. P. U.... ℔ ℔ 8½ @ 9c
A., 25c.; B, 20c.; C, 15c.; D, 12c. ℔ ℔.

SOLDER... No. 1, 15c.; No. 2, 14c

STEEL—DUTY: Bars, Ingots, Sheets and Coils, valued at 7 cents perlb., or under, 2½ cents; over 7 cents, and not above 11, 3 cents per lb., over 11, 3½ cents per lb. and 10 % ad val. Railway Bars 1¼ cents per lb. Railway Bars, in part Steel, 1 cent per lb. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as

American Cast Steel.
Tool... 15 @ 16c
Spring... 10c
Homogeneous... 12½c
Tire... 12½ @ 13½c
Machinery (round and square)... 10 @ 11c
File... 11c
Sheet... 14 @ 16c
Saw Plate, mill and mulay... 14 @ 16½c
Saw Plate, gang and X cut... 13 @ 14c
" circular as to size... 18 @ 30c

Chrome Steel.
Tool... ℔ ℔ 20 @ 21c
Tool, extra fine... " 40 @ 75c
Spring... ℔ ℔ 12c and upward
Machinery... ℔ ℔ 14c
Hammer... " 15c,
Gun or Homogeneous... " 16c

English Steel.—payable in gold, net.
" Best Cast... ℔ ℔ 17½c
" Extra Cast... " 18½c
" Round Machinery, Cast... ℔ ℔ 10½ @ 11½c
" Swaged, Cast... " 19½c
" Best Double Shear... " 17½c
" Blister, 1st quality... " 14½c
" " 2d quality... " 13 c
German Steel, Best... " 11½c
do 2d quality... " 10½c
3d quality... " 9½c
Sheet Cast Steel, 1st quality... " 17½c
" " 2d quality... " 14½c
" " 3d quality... " 12½c
File Steel, Flat and ½ Round... " 12½c
" Square and Round... " 12½c
Mill... " 13½c
Taper to 4 inch... " 16c
" Taper 3 and 3½ inch... " 18c

SPELTER—DUTY: In Pigs, Bars and Plates, $1 50 per 100 lbs.
Silesian, cash... 6½ @ 7c., gold
American " ... 7¼ @ 11c., currency

TIN—DUTY: Plates, Sheets, Tagger and Terne, 1·1c per lb.; Electro-galvanized Plates, 2 cents per lb; Manufactures of, not enumerated, 35 per cent. ad val. Bars, Block and Pigs, free. Banca, subject to duty of 10 per cent.
Banca... ℔ ℔ 24 @ 24½c., gold
Straits... ℔ ℔ 20 @ 20½c., gold
English... ℔ ℔ 21 @ 20½c., gold

TIN PLATES, CURRENCY PRICES.
I C 10x14, Prime Charcoal... 9 @ 9·50
12x12, " ... 9·50 @ 10·00
14x20, " ... 9·75 @ 10·25
I X 10x14, " ... 11·25 @ 11·75
12x12, " ... 11·75 @ 12·25
14x20, " ... 12·25 @ 12·75
D C 12½x17 " ... 8·50 @ 9·00
D X 12½x17 " ... 10·75 @ 11·25
For each additional X add... 2·25

COKE TIN PLATE.

	Best.	2d Quality.	Ordinary.
I C 10x14	$ 8·75 @ 9·00	8·25 @ 8·50	7·50 @ 8·25
I C 12x12	9·25 @ 9·50	8·50 @ 8·75	
I C 14x20	9·25 @ 9·50	8·50 @ 8·75	7·80 @ 8·00

TERNE PLATE.

	Prime Char.	2d qual.	Coke.
I C 14x20	$ 8·25 @ 8·50	8·00 @ 8·25	7·50 @ 8·00
I X 14x20	10·75		
I C 20x28	17·75 @ 18·00	16·25 @ 17·00	16·25
I X 20x28	22·50		
I C 20x28			

ZINC.—DUTY: Pig or Block, $1 50 per 100 lbs. Sheet 2½c. ℔ ℔.
Sheet... cask 10½c
" ... open 10½c

Old Metals.

(Dealers' Selling Price.)
Copper... @ 20
Yellow metal... 14 @ 15
Brass... 13 @ 14
Heavy Composition... 17 @ 18
Old lead, solid... 6 @ 6¼
Tea lead... 5
Wrought iron... 1½ @
Sheet iron... 0⅞ @ 0⅞
Cast iron... ⅞
Machinery iron... 1½ @ 1
Zinc... 5 @ 5¼
Pewter, No. 1... 17
" No. 2... 10 @ 12
Spelter... @

Paints, Oils, etc.

Paints.
Black lamp—Coach Painters... ℔ ℔ 20c
" " Ordinary... 6c
" Ivory Drop, fair... 15c
" " best... 26c
Black Paint, in oil... kegs, 8c.; ass't'd cans, 11 c
Blue, Prussian, fair to best... 50 @ 75c
" " " " in oil... 35 @ 65c
" Chinese dry... 83c
" Ultamarine... 25 @ 30c
Brown, Spanish... 1⅛c
" Van Dyke... 9c
Carmine, 40... $12 00
Green, Chrome... 15 @ 18c
" " in oil... 18 @ 25c
" Paris... good, 30c; best, 40c
" " in oil... " 30c " 45c
Mineral Paints... 1¼ @ 4c
Orange Mineral... 14c
Red Lead, American... 9¼c
" " English... 10½c
" Venetian (N. C.) dry... 2⅛c
" " in oil... ass't'd cans, 11c; kegs, 8½c
" Indian, dry... 10c
Rose Pink... 10c
Sienna American, Raw... 4c
" Burnt... 4½c
" " in oil... 16 @ 20c
" Raw " ... 15 @ 25c
Umber, Burnt... 4 @ 5c
" " in oil... 16 @ 21c
" Raw... 3⅛ @ 7½c
" " in oil... 16 @ 22c
Vermillion, Chinese...
" English... 1 25, gold
" Trieste... 1 10 "
" American, Common... 28c
White Lead, American, pure dry... 10c
" " in oil... 11c
White, Paris, English, prime... in bbls. 2⅛ @ 2½c
Yellow Ochre, French... 2⅛ @ 2⅜c
" " in oil... ass't'd cans, 11c; kegs, 8½c
" " Vermont... in casks 1½c
Yellow Chrome... 17 @ 27c
" " in oil... 18 @ 28c
Zinc White, American No. 1 dry... 9c
" " 1, in oil... 11c
" French (Paris)... 11c
" " in oil... 13c

Oils.
Linseed Raw... ℔ gal. casks, 60c. bbl., 61c
" Boiled... " 65c. " 66c
Whale, Crude... "
" Bleached Winter... " 73c
Sperm, Crude... bbl. 1·65
" Winter unbleached... " 1·90
" " Bleached... " 2 00
Seal, Extra Refined... "
Lard, Pure Winter... " 1·30
" Spring... " 1·20
Cotton Seed, Crude... " 60c
" Southern Yellow... " 65c
" White... "
Neatsfoot, Winter... 70c @ $1·10
Natural Lubricating... 35c @ 40c

Sundries.
Asphaltum... 9c
Benzine... ℔ gal. 16c
Chalk... 1⅛c
" Block...
Dryer, Patent, Am'n... ass't cans, 10½c.; kegs, 9c
" " English... " 11c; " 9c
Flocks...
Frostings... 50c
Glue, White... 33 @ 47c
" Sheet... 20c
Glaziers' Points, Zinc... 9c
Gum, Copal... 36c
" Damar... 2°c
" Shellac, English... 75c
" " " dark... 65c
Litharge... 10c
Pumice Stone, selected Lumps... 4 @ 6c
" powdered... 4c
Putty in bladders... 3⅛c
" in bulk... 3
Rotten Stone, soft, English... 8c
Spirits Turpentine... 32c
Whiting, Spanish... ⅞c

Steel.

THREE 1st. CLASS PRIZE MEDALS, CLASSES 1, 21, 22, Great Exhibition of Industry LONDON, 1851.

MEDAL OF HONOUR, SOCIETY OF ARTS & INDUSTRY, LONDON, 1856.

1st CLASS PRIZE MEDAL, CLASS 1st UNIVERSAL EXHIBITION OF INDUSTRY PARIS, 1855.

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(Limited.)

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SAML. COCKER & SON,

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CAST, SHEAR, SHEET AND BLISTEB STEEL, OF EVERY DESCRIPTION.
BEST CAST STEEL WIRE, ADAPTED SPECIALLY FOR MECHANICAL PURPOSES;
Also for ROPES, NEEDLES, FISH HOOKS, PINS, CRINOLINE, &c.

BEST CAST STEEL FILES, SAWS, EDGE TOOLS,
HACKLES, GILLS, CARD CLOTHING, CARD TEETH, HACKLE AND GILL PINS,
FISH HOOKS, NEEDLES, &c.

ALSO

GENERAL MERCHANTS.

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AND IMPORTERS OF IRON

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CHICAGO, Crerar, Adams & Co.....NEW ORLEANS, Folger & Co.
CINCINNATI, Augustus Wessel.....SAN FRANCISCO, Huntington, Hopkins & Co.

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Successor to **JOSHUA MOSS & GAMBLE BROS.**

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Cast Steel Hammers and Sledges. Also, "M. & G." Anvils and Vises.

WARRANTED CAST STEEL, especially adapted for DIES and TURNING TOOLS, DRILLS, COLD CHISELS, PUNCHES and all kinds of MACHINISTS' TOOLS.
Celebrated Improved Mild Centre Cast Steel, for Taps, Reamers, and Milling Tools, warranted not to crack in hardening Taps of any size.
Swede Spring Steel, especially adapted to Locomotive and Railway Car Springs.
English Spring and Plow Plate Steel. Also, manufacturer of

Steel Cast Steel **Shear, German, Round Machinery, Hammer, Fork and Shovel Steel**

And GENERAL MERCHANT.

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WILSON HAWKSWORTH, ELLISON & CO.,

Vienna Universal Exhibition, 1873.

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This is the ONLY Award to any Exhibitor of STEEL WIRE in the British Section.

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MINERVA AND BEAVER WORKS, WOLVERHAMPTON, ENGLAND.

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"JENKS" SPRING STEEL, "MINERVA" SWEDES, AND "ANGLO" CAST SPRING STEEL;
"JENKS" TIRE, TOE CORK, SLEIGH SHOE, BLISTER, AND PLOW STEEL;
ALSO,
"BEAVER" PLOW, TIRE, AXE, AND SHEET IRON.

VAN WART & McCOY, Agents, 134 & 136 Duane Street, N. Y.

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MANUFACTURERS OF SUPERIOR

STEEL

For Tools, Cutlery, Saws, Files, Augers, Gimblets, &c.; Sheet Cast Steel for SPRINGS AND STAMPING COLD;

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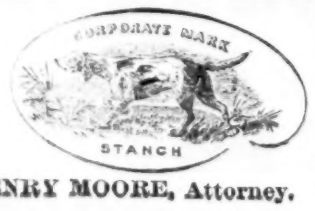
DOG BRAND FILES,

Unsurpassed, if equaled in quality.

Bailey Lane Works, Sheffield, England.

Warehouse, 82 John St., New York.

Established 1810.



HENRY MOORE, Attorney.

Steel.

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(LIMITED)

DARNALL WORKS, ATTERCLIFFE FORGE, } SHEFFIELD, ENGLAND.

Sole Manufacturers of the CELEBRATED

CAST STEEL,

Warranted most SUPERIOR and UNSURPASSED for

TOOLS and GRANITE ROCK DRILLS.

A full assortment of this universally approved OLD BRAND of English Steel, and

ARMITAGE'S GENUINE MOUSEHOLE ANVILS.

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EDWARD FRITH, 16 Cliff Street, New York.

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Sole Manufact'rs of **"CHOICE"** Extra Cast Steel.

Manufacturers of all Descriptions of Steel.

Manufacturers of Every Kind of Steel Wire.

Don Works, Sheffield, England.

JOHN HOGAN, Agent.

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Cast and Double Shear

STEEL,

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table, Carving, Butcher and Shoe Knives, Turning Tools, Dies, Files, Clock or other Springs, Saws and Tools of every variety.

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In calling the attention of consumers of Steel in any of the varieties above enumerated, we would respectfully assure them of our ability to supply an article, that cannot be excelled in quality, temper, and adaptation, in all respects to the various purposes for which it may be required. Half a century of practical experience in all departments of Steel manufacture, a long established reputation in England, and the Continent of Europe, and in the Eastern States principally of this Country, encourage us to solicit a renewed trial of our Steel for the above or other purposes, for which a first class material, in quality, temper, and durability is needed

G. SANDERSON & CO.,

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STEEL.

Bailey Street and Broad Lane Steel Works, } SHEFFIELD, ENGLAND.

Particular attention is paid to quality and temper for

Files, Saws, Table and Pocket Cutlery, Augers, Shovels, &c.

ALSO STEEL of superior quality for **Turning Tools, Taps, Dies, Drills, &c.**

Hot and Cold Rolled Sheets for Clock Springs, Corset Clasps, Pens, &c.

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BEST TOOL, MACHINERY AND SPRING STEELS.

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CAST STEEL,

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SAW PLATES,

All descriptions of **Cast and German**

Spring and Plow Steel

Elliptic and Side Springs, Seat Springs.

AXLES, STEEL TIRE,

Plow Wings, Shares, Cultivators, Reaper Bars, ow Bars, &c., &c.

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EQUAL TO ANY IN THE MARKET.

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POWDER.

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THE MOST POPULAR POWDER IN USE.

Also, SPORTING, MINING, SHIPPING, AND BLASTING POWDER,

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invite the attention of the the Hardware Trade to their facilities for delivering

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POWDER

IN EVERY PART OF THE UNITED STATES from having agencies and magazines at all prominent points, beside our works at

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SAFETY-FUSE at wholesale.

WOODEN TOOTH

Curry Comb.

The Best yet Invented.

CHEAP AND DURABLE.

Is Pleasant to the Horse, and does not injure the Brush.

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Steel.

HUSSEY, WELLS & CO.

MANUFACTURERS OF ALL DESCRIPTIONS OF

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INCLUDING

Best Refined Steel for Edge Tools.

PARTICULAR ATTENTION PAID TO THE MANUFACTURE OF STEEL FOR

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"Hussey, Wells & Co. Cast Spring Steel,"

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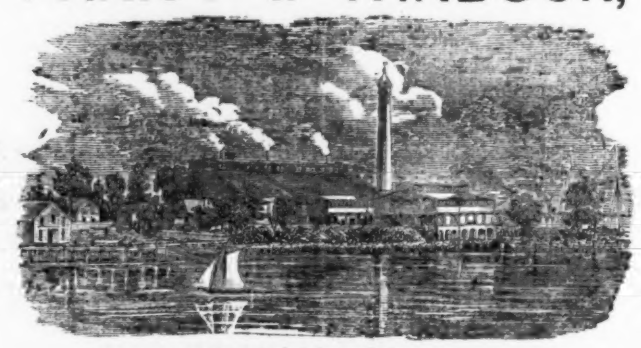

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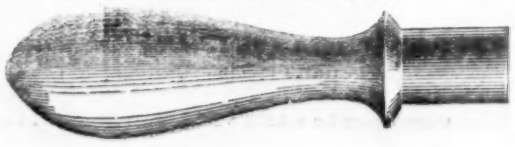

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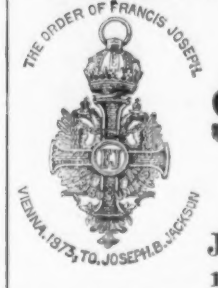

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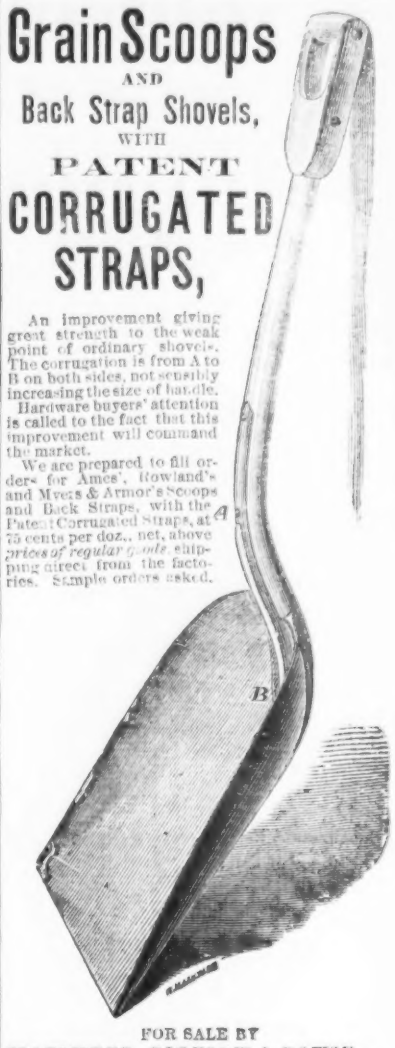

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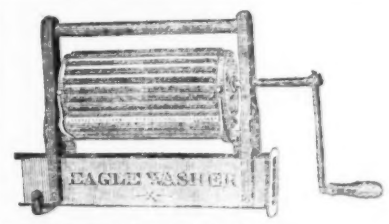

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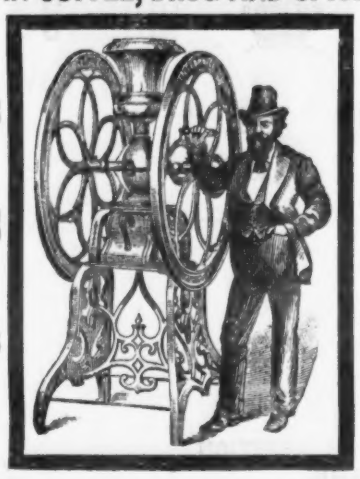

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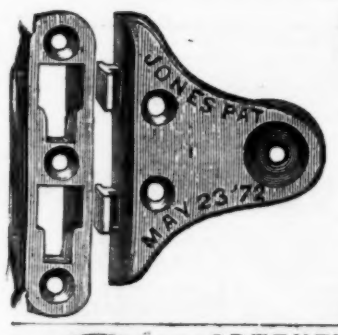

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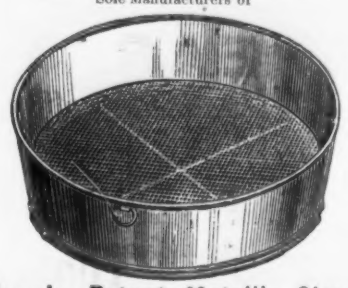

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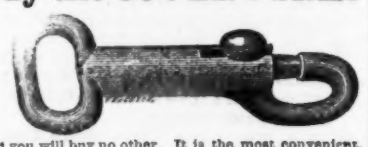

And you will buy no other. It is the most convenient, durable, safe and reliable Snap ever used. It has a brass coil spring that is four times as long as any other coil spring snap, and is enclosed in the barrel back of the bolt, making a snap which works freely under all circumstances, and without danger of having its parts broken or disarranged. We manufacture all sizes of Harness Snaps and Round Eye Snaps, and Covert's Patent Thimble to go on rope for Cattle and Horse Ties. Also other goods.

Send for price list and circulars.

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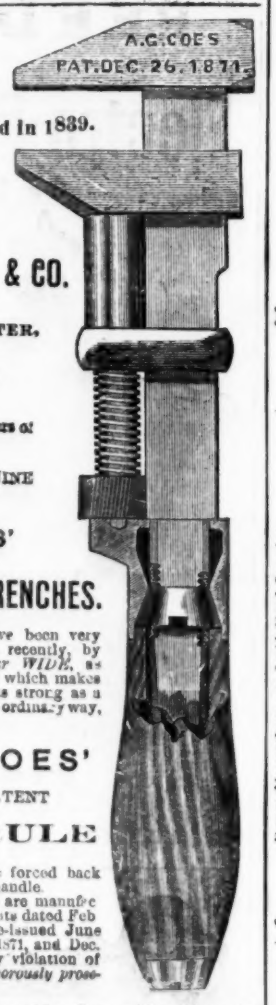

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Which cannot be forced back into the handle.

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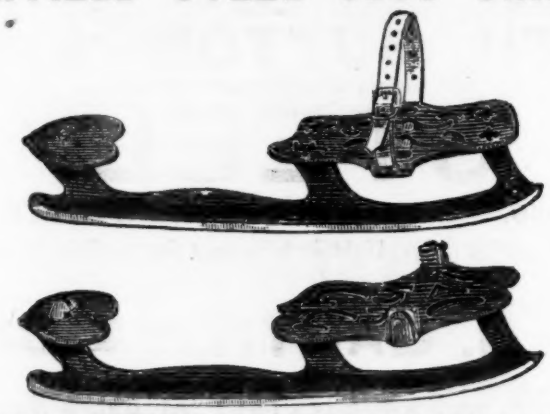

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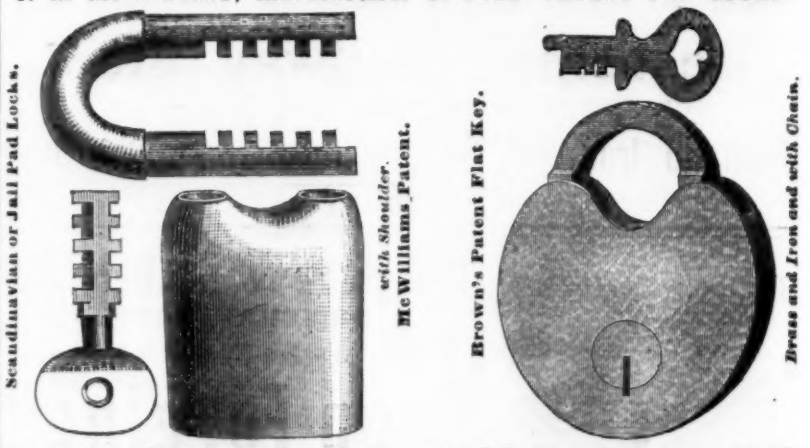

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Connecticut Valley Auger Bits .....dis 40&10 %
Cook's Bits.....dis 40 10&10 %
Jennings' Bits.....dis 10 %
Bates' Nut Augers.....dis 40 & 10 %
Douglass' & Ives' Augers.....dis 40&10 %
Watrous' Ship Augers.....dis 10&15 %
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Stearns' Patent Hollow Augers.....dis 25 %
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Landers, Frary & Clark's.....} Sold on Morton's new
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Western " " .....dis 75 %
Philadelphia " " .....dis 60 %
" Eagle, (Coleman's).....dis 60 %
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Braces.—Barber's.....dis 40&5 %
Packus.....dis 50 %
Bartholomew's American Ball... dis 10&10 @ 15&10 %
Spogard.....dis 50 %
Butts.—Cast Fast Joint, Narrow... dis 25&10 @ 30&10 %
" " Broad.....dis 35&10 @ 40&10 %
Cast Fast Loose Joint.....dis 45&10 @ 50 & 10 %
" Acorn, Loose Pin.....dis 4 &10 @ 45&10 %
" Marers & Parliament.....dis 35&10 @ 40&10 %
" Acorn Jap'd.....dis 45&10 @ 50&10 %
Wrought Loose Pin.....dis 35 %
" Table Hinges and Back Flaps.....dis 50 %
" Narrow.....dis 30 %
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Parker's Blind Butts....
Sheperd's " ....
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Lull & Porter's Hinges....dis 60 %; by the case, 60&5 %
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" Coil.....dis 30 %
Galvanized Pump..... net 13 @ 13½c
Best Proof Coil Chain—

₱ ℔..	¼	5-16	⅜	7-16	½	⅝	¾	⅞	1 in.
	14	10¼	9½	9	8¾	8¼	8c	gold	

By the cask, 500 lbs., ½c per lb. less Common Chain, ¼c per lb. less.
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Socket Firmer.....dis 60 @ 60&10 %
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Beatty's Framing and Firmer.....dis 2 %
Casters.—Iron Bed.....dis 50&10 @ 40 %
Porcelain Wheel Bed.....dis 40&10 @ 50 %
Iron and Brass Wheel Plate.....dis 40 @ 10&10 %
Porcelain Wheel .....dis 50 @ 50&10 %
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Discount on 2 dozen lots, $4 per dozen.
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Patent Box and Side.....dis 15 %
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Drawing Knives.—Hart Mfg. Co.'s.....dis 60 %
Adjustable Handle.....dis 10 @ 15 %
Beatty.....dis 15 @ 50 %
Fry Pans.
Tinned.....dis 40 @ 45 %

₱ doz..	$3 50	4 00	4 50	5 00	5 50	6 50	7 50	9 00	10 00
No....	0	1	2	3	4	5	6	7	8

Burnished.....dis 0 @ 45 %

₱ doz..	$3 00	3 25	4 25	4 75	5 25	6 00	7 00	8 00	9 00
No....	0	1	2	3	4	5	6	7	8

Files.
Nicholson Mill Files.....new list
" Bastard.....
" Taper.....
Butcher's Mill (Advanced March 8th)...$5 25 to £ gold
" Bastard..... 5 25 to £ gold
" Taper..... 5 25 to £ gold
Fluting Machines.
E. F. M.—4¼ in. rolls, $5·50.....dis 15 %
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Mrs. Knox—4 in. rolls, $5·50.....dis 20 %
" —6 in. rolls, 7·00.....dis 20 %
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Verce.....dis 20 %
Hatchets.
Beatty's.....dis 15 @ 20 %

Shingling and Half.	₱ doz..	$7 00	7 50	7·75	8·00
	No.....	1	2	3	

Yerkes & Plumb.....dis 15 %

Shingling and Half.	₱ doz..	$7 00	7 50	8·00	8·50
	No....	1	2	3	4
Claw....	₱ doz..	$7 50	8·00		
	No....	1	2	3	4

Hinges.
Strap and T. (Changed March 24).....dis 45 %
Horse Nails.

	Nos.	6	7	8	9	10
Ausable		27	25	24	23	22
Globe		24	26	25	24	23
Brundage		26	24	23	22	21
	Nos.	5	6	7	8	9	10
Putnam		32	28	26	25	24	23

On Ausable, Globe and Brundage 1000 ℔ lots.....dis 5 %
Knobs.—Door, Mortise and Rim.
Makes in Combination.....new list dis 45&5 %
Extra discount for cash 2 %
Mineral and Rim.....dis 5 %
Locks and Latches.—Rim and Mortise.....dis 40 %
Extra discount for cash 2 %
Till and Cupboard.....dis 25 %
American Padlocks.....dis 40 %
Extra discount for cash 2 %
Scandinavian Pad Locks.

₱ doz..	$10·50	10·50	12·00	12·00	13·00	15·00	dis 15 %
No....	9	9½	10	10½	11	11½	
₱ doz..	$12·00	13·00	14·00	15·00	22·00	24·00	dis 15 %
No....	12	12½	13	13½			

Trunk Locks......dis 5 @ 10 %
Thumb and Rotgens Latches.....dis 25 %
Lanterns.—Square Candle and Oil.....dis 10 %
Globe for Oil.....dis 10 %
" " Kerosene.....dis 10 %
Tubular Lanterns.....dis 10 %
Mattocks.—Long and Short Cutter.....dis 25 %
Western Pattern.....dis 25 %
Pennsylvania Pattern.....dis 15 %
Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets.....dis 20 %
Stebbins' Gates.....dis 62½ @ (2½&10 %
Lincoln's " .....dis 40&10 @ 50 %
Landers, Frary & Clark's Petroleum.....dis 15&10 %
Taylor's Petroleum Faucets.....dis 20&10 %
Brass Liquor Cocks .....dis 20&10 %
Meat Cutters.—Dixon's.....dis 2 %
Woodruff.....dis 2 %
Stowe.....dis 20 %
Hale's.....dis 35 %
Stuffers.....dis 30 %
Planes.—Auburn Tool Co.. " Bonon .....dis 40 %
Second Quality.....dis 50 %
Metallic Plane Co.....dis 2½&5 %
Evans Pat. Circular .....net
Plumbs and Levels.
Adjustable.....dis 60&10 %
Non-Adjustable.....dis 60, 10&10 %
Plane Irons.—American.....list net
Butcher's.....gold £, $5 50
Pulleys.—Philadelphia.....net
Pittsburgh.....net
Rules......dis 60, 10&10 @ 70 %
Rakes.—Cast Steel Garden.....dis 4 @ 40&5 %
Malleable Garden.....dis 40 @ 4 &5 %
Wood Head Iron Teeth.....dis 40 %
Steelyards.—American Pattern.....dis 15 %

₱ doz....	$5·50	7·00	9·00	1 00	11·00	12·00
No....	50	100	150	200	250	300

English Pattern.....dis 15 %

₱ doz....	$7·00	8·67	10·67	12·67	14·67	16·67
No....	50	100	150	200	250	300

L. F. & C. Excelsior.....dis 10 %

₱ doz....	$9·00	10·00	12·00	15·00	18·00	21·00
No....	50	100	150	200	250	300

Scythes.—Golden Clipper, Damascus Blade Boxed and Sharpened.....₱ doz. $10·00 net
Golden Clipper No. 1). Boxed and Sharpened.....₱ doz $9·75 net
Grass Clipper No. 5, Boxed and Sharpened.....₱ doz $9·50 net
Common Scythes.....₱ doz $7·50 @ 9·00
Screws.—Steel and Iron, new list.....dis 50 %
Saws.—Disston's Great Cut.....dis 15 %
Disston's Hand.....dis 12½ %
W. McNeese's Rip Cross-Cut & Circ'r new list dis 15 %
Boynton's Lightning new list.....dis 40 %
" Grindst'n .....dis 45 %
Shovels and Spades.
Rowland's Plain Back, Jan. 23d.....dis 40 %
" Back Strap .....dis 40 %
Oliver Ames & Sons.....dis 40 %
Ames Shovel Co.....dis 2 &5 %
Sad Irons.—Polishing (polished faces).....per lb. 5½c
Richmond (polished face).....by the case 5½c
Stone.—Arkansas Oil, No. 1.....₱ ℔ 8
Turkey Oil, No. 1..... "
Washita Extra..... " 95c
" No. 1..... " 8c
" " 2..... " 2½
..... " 5½c

BUFFALO.

Reported by Messrs. Sidney Shepard & Co. August 9, 1875.

Augers—Snell Mfg. Co.....dis 25 %
Axes—Francis.....dis 25 %
Bits, Auger—Snell Mfg. Co.....dis 25 %
Phœnix.....dis 40 %
Bells, Cow—Saw's Genuine.....dis 30 %
Braces—Bit, Spofford's Patent.....dis 50 %
Brads, Cut.....dis 50 %
Boards—Stove, Brooks' Pat. dis 35 & 4 mos.; 35&5 % 30 dys
Butts—Brass.....dis 5 %
Wrought Narrow.....dis 30 %
" Broad, Loose Joint.....dis 35 %
" Table and Back Flaps.....dis 30 %
Wrought Butts, Loose Pin.....dis 35 %
Belting—Rubber.....dis 30 @ 1½ %
Leather, new list, oak tanned.....dis 20 %
Brick—Bath (box of 2 doz) Best English.....$1·25
" Chatterton.....$1·00
Can Openers—Sprague's.....dis 50 %
Cases—Parlor Coal Hod.....dis 15 %
Chalk—White, Carpenter's .....₱ gross. 57c
" Red, Carpenter's .....₱ gross. 90c
Chisels—Firmer Socket.....dis 60, 10&10 %
Framing Socket.....dis 60, 10&10 %
Corner Socket Chisels.....dis 60, 10&10 %
Slick's Carpenters'.....dis 60, 10&10 %
Castings—Malleable .....₱ ℔ 9½c
Egg Beaters—" Peerless".....per doz $3·50
" Centripetal".....per doz 5·00
Elbows—Corrugated.....

	5	5½	6	7	
Charcoal	$3·50	4·50	5·25	6·50	dis 10 %
Russia	7·00	9·50	12·00	14·00	

Files—Maischoss Bros. .....dis 80 %
Fluters—Geneva Hand.....₱ doz. $15 00
Freezers Ice Cream—" Champion .....dis 33½ %
Hammers—Henry W. Kip's.....dis 10 %
Hinges, Gate—Shepard's.....dis 40&10 %
Hinges—Window Blind—
Sheward's and Standard.....dis 60&10 %
Wrought Strap and T.....dis 60&10 %
Hods, Coal—Plain, Black and Galvan'd...new list dis 15 %
Funnel, Black and Galvanized..... " dis 15 %
Fancy and Helmet..... " dis 15 %
Sad Irons.....dis 15 %
Kettles—Brass.....33½ %
Copper, " Hand Made".....₱ ℔., 35c
Enameled.....dis 50&10 %
Knives, Drawing—Oval No. 1.....dis 60, 10&10 %
Razor Blades.....dis 60&10 %
Lanterns " Peerless. .....No. 1 2 3
₱ doz $36 00 $10 50 $13 75 dis 10 %
Tubular.....$11 00
" with Guards.....
Machines—Apple Paring, " Keystone".....7·75 ₱ doz
Machines—Boring, Snell's.....dis 20 %
Mills, Coffee—Box and Side, common.....dis 15 %
Box Union and Eagle.....dis 15 %
" American.....dis 15 %
Molasses Gates—" Self Measuring".....dis 20 %
Nails—Clout and Finishing.....dis 7½ %
Shoe.....dis 7½ %
Horse, Ausable.....No. 5 6 7 8 9 10
30 27 25 24 23 22c
" " Pointed & Polished.....add 1c ₱ 1000 lbs.....dis 5 %
" " Clinton.....No. 6 7 8 9 10
21 19 18 17 16c
Packing—Rubber.....dis 30 @ 10 %
Paint—White Lead, U. S. Gov't.....₱ ℔ 8½c
Pans—Dripping.....₱ ℔ 10c
Rivets—Iron, Black and Tinned.....dis 25&7½ %
Screws—"American Screw Co"—
Flat Head, Iron.....dis 62½ %
Flat Head, Brass.....dis 52½ %
Skates and Straps—White's.....dis 20 %
Spoons, Iron Tinned.....dis 10 %
" by the case.....dis 20 %
Plated Rogers' A No. 1.....dis 50 %
Britannia.....dis 50&10 %
Squares—Steel and Iron.....new list 50 %
Scales—Buffalo Scale Works.....dis 25 %
Fairbanks.....dis 15 %
Stove Polish—Gem.....₱ gross, $4·50
" Dixon's.....6·00
Tacks—Half Weight Am. Iron.....dis 72½&7½ %
Vases—Palace Coal.....dis 15 %
Vises—
Parallel, Buffalo...Old pattern, dis. 30 %; new, do.dis 20 %
Ware—French, Tinned and Iron.....dis 20 %
Stamped and Japanned.....dis 5 %
Cast Iron Hollow.....dis 40 %
Wire—Bessemer Steel.....dis 10 %
Tin Plates.—Add for each X.....2·50
10x14, IC. Charcoal...$10·00 | 14x20 C. terne.....$ 9·00
12x12, " ...10·50 | 20x28 C. " .....27·00
12½x17, " ...9·50 | 20x28 X. " .....25·00
14x20, " ...11·00
Pig Tin—Straits.....24c @ 25c
Bar Tin.....26c
Solder—No. 1, Crook's.....16 c
Sheet Zinc—
" Lasalle ".....570 ℔ casks
.....$11·75 11·00 ₱ 100 lbs
Sheets.....$10·75
Babbitt Metal.....₱ ℔ 12c
Iron Wire—Bright and Annealed.....dis 45 %
Coppered.....dis 40 %
Tinned.....dis 25 %
Tinned Broom, { Nos. 20 21 22 / 20c 21c 21c } .....dis 33 %
Copper—Sheathing 14 @ 16 oz.....₱ ℔ 35c
Planished.....₱ ℔ 37c @ 39c
Bottoms.....₱ ℔ 33c
Bolts.....₱ ℔ 31 @ 33c
Braziers' Sheets.....₱ ℔ 31 @ 33c
Sheet Iron.—

	Com. B.	Fin. S.	L. U.	D Re'fd.
	smooth			smooth
15 to 20	4c	5·10c		7·10
22 to 24	4·10c	5·20		7·20
26	4·30c	5·30		7·30
2	4½c	5½c		7·50
29	5½c			

Galvanized Iron.—2nd bundles.....dis 37½ %
Nos. 15 to 21.....12c | No. 26.....14c
22 to 24.....13c | 27.....15c
Bar Steel.—Silver, ₱ ℔ 10c Cast-steel, 12c.
Iron Wire.....dis 37½ %
Enameled Ware.....dis 50 %

CINCINNATI.

Reported by Sellew & Co., Importers and Jobbers Metals, No. 214, 216 and 218 Main street. August 2d, 1875.

Tin Plate.—I. C. 10x14 Charcoal.....$10 50 @ 11·50
I. X. 10x14 Charcoal..... 12 50 @ 14·00
I. C. Terne 14x20..... 9·50 @ 11·00
I. C. Terne 20x28..... 20·50 @ 23·00
I. C. 28 inches Continuous..... 21·00
Block Tin.—
Pig.....₱ ℔ 26c
Bars.....₱ ℔ 27c
Solder.—
A 1.....₱ ℔ 16c
Roofing.....₱ ℔ 14c
S. & Co.....₱ ℔ 21c
Lead.—Pig.....₱ ℔ 6c @ 7½c.
Bar.....₱ ℔ 8½c
Copper.—
Ingot.....₱ ℔ @ 24c
Planished..... " @ 35c
Sheathing..... " @ 31c
Copper Drops..... " @ 34c
Sheets.. 6 to 7 lb..... " @ 37c
" 8 to 9 lb..... " @ 35c
" 10 to 12 lb..... " @ 32c
" 13 lb. up..... " @ 31c
Copper Bottoms..... " @ 39c
Zinc. Cast, 5.0 to 1100 lbs.....₱ ℔ .09½ @ 10¼c
Case, 100 lbs..... " 10¼ @ 11 c
Slab..... " 7½c
Brass.—Roll, No. 6 to 30.....₱ ℔ 30c
Roll, No. 30 to 32..... " 33c
Wire, No. 0 to 20..... " 33c
" 20 to 32..... " 34c
Babbit Metal.—Sellew & Co..... " 20c
Adams'..... " 6c
Market..... " 12c
Antimony.....₱ ℔ 14c
Bismuth.....₱ ℔ 2 @ 2 10
Nickel.....₱ ℔ 75 @ 80
Russia Iron.—Bundle.....₱ ℔ 8½c
Less than bundle..... ₱ ℔ 10c
No. Stamped.....₱ ℔ 15c @ 16c
Sheet Iron.

	Com. B.	Fin. S.	L. U.	D Re'fd.
	smooth			smooth
15 to 20	4c	5·10c		7·10
22 to 24	4·10c	5·20		7·20
26	4·30c	5·30		7·30
2	4½c	5½c		7·50
29	5½c			

Galvanized Iron.—2nd bundles.....dis 37½ %
Nos. 15 to 21.....12c | No. 26.....14c
22 to 24.....13c | 27.....15c
Bar Steel.—Silver, ₱ ℔ 10c Cast-steel, 12c.
Iron Wire.....dis 37½ %
Enameled Ware.....dis 50 %
One Piece Corrugated Elbows.....dis 10 %

Charcoal Iron.		Russia Iron.	
4½ inch.....	₱ doz $2·50	4½ inch.....	₱ doz $5·00
5 "	" 3·50	5 "	" 7·00
5½ "	" 4·50	5½ "	" 9·50
6 "	" 5·50	6 "	" 12·00
7 "	" 6·50	7 "	" 14·00

Lender Elbows, Flat Crimp Retinned or Galvanized.—Dis. 10 %

	₱ doz.		₱ doz.
2 inch.....	$1 75	2½-inch.....	$2 75
3-inch.....	2 25	3½-inch.....	3 25
4-inch.....	2 50	4½-inch.....	3 50

Sheet Iron Bread Pans.....₱ ℔ 8½c
American Broilers.....₱ doz. $3·50
Tinmen's Machines..... dis 3 %
Sad Irons.....₱ ℔. 3½ @ 3¾c
Brass Kettles.—Ansonia..... 45c
Dog Irons..... 3½c

PITTSBURGH.

The following are the Card rates of Lewis, Oliver & Phillips, H. B. Newhall, 11 Warren St., New York, Agent. Iron, standard list assorted sizes, for large orders, specifications to include Bands, small Rounds and Ovals, 20c. rate, 2 % off net.
Flat Rail (1¼x¼), punched and coun'sunk..4·1c ₱ ℔ net
Iron Wedges..... 4½c ₱ ℔ net
Norway Nail Rods..... 8½c ₱ ℔ net
Crow Bars (in ordering please state whether "Wedge" or "Pinch" point).....4½c ₱ ℔ net
Beetle Rings.....8 c ₱ ℔ net
Fence Pickets—
⅝ round, bent to shape, 25c ₱ ft. of fence, less 15 % off net.
Discount off Standard List.
Carriage and Tire Bolts.....75 % off net
Carriage and Tire Bolts delivered on cars or boats in Pittsburgh.....
Stove Bolts.....20 % off net
Machine and Square Head Bolts.....40&10 % off net
Coach and Lag Screws.....40&10 % off net
Bolt Ends.....40 % off net
Pat. Hot Pressed Square and Hexagon Nuts, small sizes, from 3-16 to ⅝ in.....8½c ₱ ℔ off net
Pat. Hot Pressed Square and Hexagon Nuts, large sizes, from 7-16 to 2 in.....6½c ₱ ℔ off net
Washers, all made from new band iron, small sizes, from 3-16 to ⅝ in.....9½c ₱ ℔ off net
Washers, all made from new band iron, large sizes, from 7-16 to 1¼ in.....7½c ₱ ℔ off net
Nuts and Washers in 25 lb. boxes, ½c ₱ ℔ ex. Nuts and Washers in lots less than one keg each size, ½c ₱ ℔ ex. Nuts and Washers in 5 lb. boxes, 1c. ₱ ℔ ex. net prices.
Standard Caps, for Plows.....5½c. ₱ ℔ net
Iron Harrow Teeth, in lots of 1 ton or more, packed in 200 lb. boxes, 1 in. diam. 3½c ₱ ℔ net; ⅞ in. diam. 3½c ₱ ℔ net; ¾ in. diam. 3½c ₱ ℔ net.
Patent Headed Harrow Teeth, packed in boxes ½c ₱ ℔ ex
Skein Bolts, in bulk, in lots of 1 keg or more, ⅝ in. diam. 5c ₱ ℔ net; 9-16 in. diam. 6c ₱ ℔ net; ½ in. diam. 7c ₱ ℔ net. 1c ₱ ℔ extra when less than 1 keg of each size is ordered.
Strap & T Hinges...33⅓&10 % off net, delivery as cust'ry
Screw Hitching Rings.....$5 25 ₱ 100 net
Bridge and Roof Bolts—
1 to 2 in. diam. over 8 ft. long..... ₱ ℔ 3½c net
1 to 2 in. diam. from 4 to 8 ft. long..... " 4 c net
1 to 2 in. diam. from 1½ to 4 ft. long..... " 4½c net
⅝, ¾ and ⅞ in. diam. over 4 ft. long..... " 4½c net
⅝, ¾ and ⅞ in. diam. from 1½ to 4 ft. long " 5 c net
Bridge bolts with upset ends..... ½c. ₱ ℔ extra
Wrought iron plates, punched.....4½c. ₱ ℔ net
Cast Iron Washers..... ₱ ℔ 3½c net
Duck Nest Tuyere Irons.....$14 50 ₱ doz net

WAGON HARDWARE.

Wagon Box Strap Bolts—

10 in. long by 7-16 at	Screw End,	₱ set of	3	bolts..	45c
12 " ½	"	"	3	"	55c
10 " 9-16	"	"	3	"	65c
12 " 9-16	"	"	3	"	75c
14 " 9-16	"	"	3	"	80c
10 " ⅝	"	"	3	"	80c
12 " ⅝	"	"	3	"	90c
14 " ⅝	"	"	3	"	90c
16 " ⅝	"	"	3	"	1 00
18 " ⅝	"	"	3	"	1 10
20 " ⅝	"	"	3	"	1 20

5c ₱ set for each additional inch over 14 in All lengths made.
In ordering Box Strap Bolts please give diameter at Screw End.
Wagon Box Rods, narrow track, each.....18c
" " wide track, each.....17c
Single Tree Irons, ₱ set of four pieces.....80c
Wrought Iron Bolster Plates, 2½ in. wide, ₱ set.....45c
" " " 3 " " 60c
" " " 3½ " " 85c
" " " 3¾ " " 10c
Wagon Brake Ratchets, each.....14 c
" " " finished with guard, each..40 c
Wrought Hammer Straps, heavy pattern, each.....13 c
" " " light " each.....12 c
" Rub Irons, each.....9 c
Stay Chain Hooks, each.....5½c
Double and Single Tree Clips, figure 1, each.....8 c
" " " 2, each.....9 c
" " " 3, each.....11 c
Axle Clips, Round Part ⅝, Flat Part 1¼, each.....8c
Wagon Clevis, including Pin, complete, each.....10c
Pole Caps, each.....24c
Single Tree Hooks, Nos. 1 and 2.....4½c
Strap Bolts, Rods, Single Tree Irons, Bolster Plates, Brake Ratchets, Hammer Straps, Rub Irons, Stay Chain Hooks, Clevis and Pin, Clips, Single Tree Hooks, and Pole Caps, in lots of 50 sets.....dis 15 %
Wagon Box Staples, 1½ to 2½ in. to clinch, ₱ 1000 $11 00 net
" " " Bevel Box Iron, to rivet on, ₱ 1000 7 50 net
Neck Yoke Eyes, each.....4½c net
" " with ⅝ rings, each.....7½c net
King Bolts, ⅝, 1, 1¼, and 1½ in. diam.....₱ ℔ 4½c net
Wagon Rivets, ex. large, flat, oval and steeple head, ¼ in. diam. all lengths..... " 5½c net
Wagon Rivets, 3-16 in. diam., all lengths..... " 9½c net
" ⅜ to 1 inch long..... ₱ ℔ 1c extra
" & Nails, in 5 ℔ paper boxes..... " 1c extra
" in 25 ℔ wood " ..... " ½c extra
Wagon and Hinge Nails, ¼ in. ₱ ℔ 17 c net
" " 5-16 in. " 19 c net
Wagon Rivets and Nails, in less lots than one keg each size..... " ½c extra
Double Tree Plates..... " 30 net
Coupling " ..... " 50 net
Tongue " ..... " 8½c net
Neck Yoke Plates..... " 10½c net
Tongue Cap Iron, 1¼, 2 & 2½ in. wide, same price ₱ ℔ as Band Iron.
Wagon Chains, Stay, Lock and Tongue, 5-16 in. ₱ ℔ 10½c net. ¼ in., 11½c. net
Above prices are free on board cars in Pittsburgh. Subject to change of market, without notice.

DETROIT.

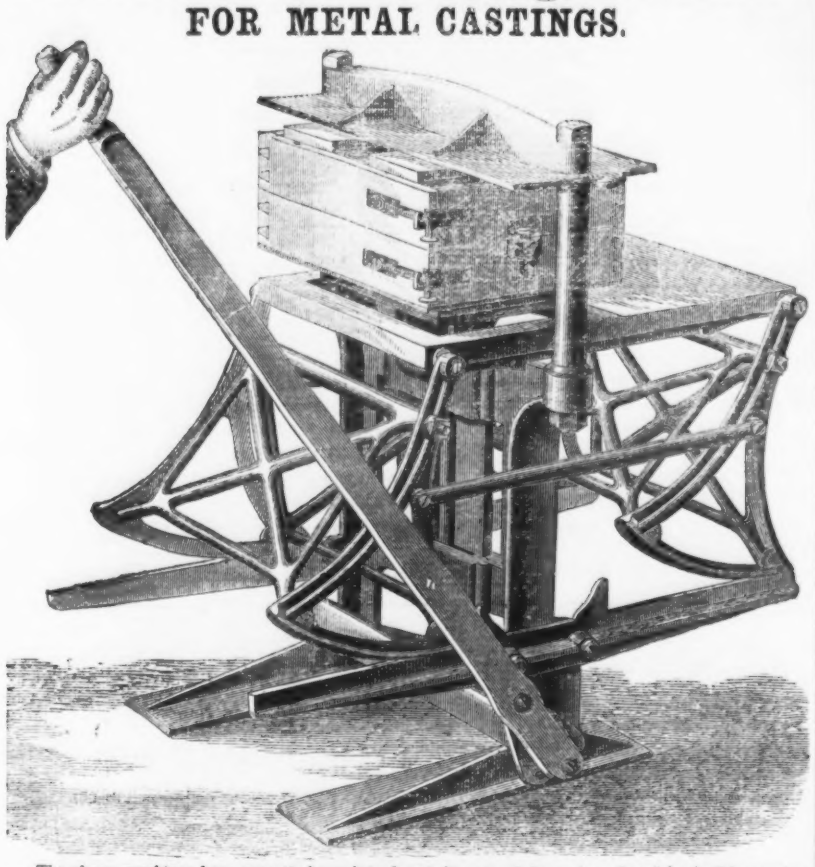
(Reported by Messrs. Jewett & Root.)

August 30, 1875.

Tin Plate.—Best Charcoal
IC. 10x14.....$10 25
IX, 10x14..... 13 00
XX, 10x14..... 15 75
IC. 12x12..... 10 75
IX. 12x12..... 13 50
IC. 14x20..... 11 25
IX. 14x20..... 14 00
XX. 14x20..... 16 75
XXX. 14x20..... 19 50
XXXX. 14x20..... 22 25
DC. 100 Plate..... 9 75
DX. " 12 50
DXX. " 15 25
DXXX " 18 00
DXXXX 100 Plate.. 20 25
IX. 14x14..... 21 50
IC. 10x14 W..... 9 75
IX. 10x14 W..... 12 50
Roofing Tin.—Best Char.
IC. Terne, 14x20..... $ 9 50
IX. " 14x20..... 12 25
IC. Terne, 20x28..... 19 00
IX. " 20x28..... 25 00
Coke Tin.—
IC. 10x14 Coke.....$ 9 25
IX. 10x14 Coke..... 12 00
IC. 14x20. " 10 25
Solder.—No. 1..... 18c
No. 2..... 15c
Pig Tin.—
Large Pigs.....24c
Small Pigs.....25c
Bars.....26c
Bright Wire.
65 lbs. in bdl.....dis —
Copper.—
Sheathing.....31c
Copper Bottoms.....33c
Planished Copper.—
Sheathing, 14x48.....33c
Boiler Size, No. 7.....40c
" " No. 8.....40c
" " No. 9.....40c
Sheet Iron.—
No. 18 Am. Com.....4 00
No. 24 Am. Com.....4 20
No. 26 Am. Com.....4 40
No. 27 Am. Com.....4 60
W. D. WOOD'S & CO.'S SHEET IRON.—
Nos. 15 to 20 Smooth $5 00
" 21 to 24..... 5 20
" 25 & 26..... 5 40
" 21 to 24 Charl'l.. 6 70
" 25 & 26 " .. 6 90
RUSSIA.
Genuine.....17c
Imitation.....14c

Eames' Pat. Molding Machine

FOR METAL CASTINGS.



The above machines have recently been introduced in several large iron foundries in this country, where they have given entire satisfaction. Among the advantages are :

1st. A great saving in the cost of producing castings.

2d. A man can learn to mold with the machine in less than 30 days' time.

3d. The castings produced will be found more perfect, less poor work, and more uniform than if molded by the old method.

The machine is adapted for either Iron or Brass Castings. *Price Reduced.* For further particulars, send for Circular. Address,

P. & F. CORBIN,

EXCLUSIVE LICENSES,

Also Manufacturers of *Architectural Bronze Work, Locks, Hinges and fine Builders' Hardware generally.*

New Britain, Conn. New York, 87 Chambers St.

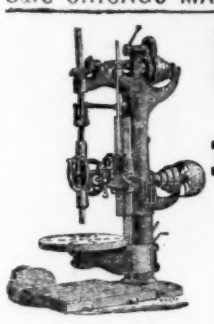
Ewart's Detachable Drive Chain.

PAT'D.

Positive transmission without stretch ; runs quietly and is frictionless ; better than Belts for all exposed or irregular work, or for the attachment of slats or buckets, and for Transferring Power generally.

Address W. D. EWART,

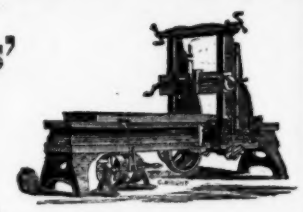
Care CHICAGO MALLEABLE IRON CO., No. 116 Lake Street. Chicago, Ills.



Fitchburg Machine Co.

Manufacturers of

Machinists' TOOLS.



Office and Works,

Summer Street,

FITCHBURG, MASS.

CENTENNIAL

SELF-LUBRICATIVE

Hemp Piston Packing

FOR

Locomotives, Steamships, Stationary Engines, Hot or Cold Water Pumps.

Recommended by Master Mechanics and Engineers, as the cheapest and best in market. **No more Extortionate Prices. No more Fluted Rods**—but a good article at fair price.

JOHN CANFIELD & CO.,

SOLE MANUFACTURERS,

Office, 1321 Fairmount Ave., Phila.

PATENT APPLIED FOR. Send for Circular.

THE NATIONAL STEEL TUBE CLEANER.

Patented July 28, 1874.

Guaranteed to clean better, last longer & work easier than any in the market.

REMOVES ALL

Carbon and Scale from the Boiler Tubes.

ADOPTED AND IN USE BY UNITED STATES NAVY.

For sale by dealers.

THE CHALMERS SPENCE CO. Foot of East 9th St., New York, Agents for the United States.

RICHARD DUDGEON,

No. 24 Columbia Street, New York,

MAKER AND PATENTEE OF

Hydraulic Jacks and Punches,

ROLLER TUBE EXPANDERS

And Direct-Acting Steam Hammers.

Communications by letter will receive prompt attention.

JACKS for Pressing on Car Wheels or CRANK PINS made to order

BILLINGS & SPENCER CO.

MANUFACTURERS OF

CLAMP, DIE AND COMMON

LATHE DOGS.

Vienna, 1873.

Forged from Bar Steel *And Hardened*

Under Billings's Patent Process.

For Progress.

FIRST CLASS ARTICLES,

and something that every machinist and Tool Maker will appreciate.

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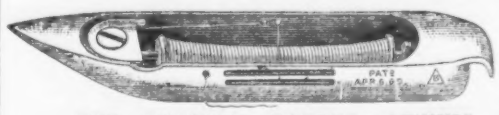

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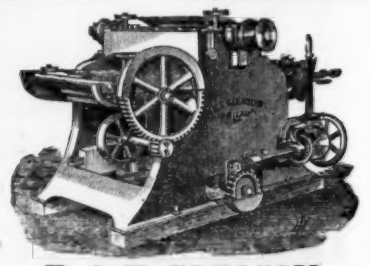

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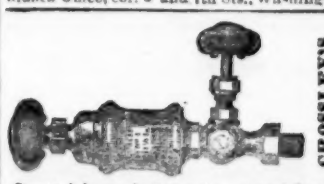

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For Hotels & Stores a specialty.

Machinery in General made to order.

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Augers.—Watrous Ship....dis 10 %
L'Hommedieu Ship....dis 15 %
Axes.—Forester's Favorite, Bronzed....$11 50
Blue Jackets, Blue....11 00
Excelsior, Black....10 50
Chopper's Pride, Bronzed....10 50
Red Cross, Red....9 00
Red Cross, Handled....12 00
Boy's Handled Blue Jackets....11 00
Axe Handles.—Wadleigh's Oak—
A (Extra) $2·50. B (No. 1) $2·00. C (No. 2) $1·50 ℔ doz
Bells, Sleigh—
Fancy Body, Patent Leather, Cloth Bound, White Metal, 30, No. 1....$1·70
Fancy Body, Patent Leather, Cloth Bound, White Metal, 36, No. 1....1·80
Fancy Body, Patent Leather, Leather Bound, Extra Tinned, 30, No. 1....·88
Fancy Body, Patent Leather, Leather Bound, Extra Tinned, 36, No. 1....2·50
Fancy Body, Patent Leather, Leather Bound, Silver Plated, 30, No. 1....3·88
Fancy Body, Patent Leather, Leather Bound, Silver Plated, 36, No. 1....3·50
Shaft, Strap, White Metal, House Bells, extra, 6, No. 1....per pair, 50c.
Common, 6, No. 1...." 45c.
Blind Hinges.—
Orr or Washburn's....per hundred sets $9 50
Blind Fasts.—
Orr or Washburn's....per hundred set $6 00
Bolts.—Carriage, Phila., "Girard Works....dis 50&10 %
Borax.—Best Refined....℔ 15c
Borers.—Angle, Backus'....dis 30 %
Boring Machines.—Angle....each $4 75
Common, Snell's quality....each 3 75
Braces.—Barber's....dis 40&5 %
Backus'....dis 50 %
Spofford's....dis 50 %
Amidon....dis 50 %
Brackets.—Star Bronzed....new list net
Star Japanned....new list net
Store Shelf....new list net
Brass Faucets.—L. F. & C....dis 25&10 %
Butts.—Union Drilled Loose Joint....dis 45&10 %
" " Wire Fast Joint....dis 25&10 %
" " Acorn Loose Joint....dis 45&10 %
Brass Butts....dis 30 %
Wrought Table Butts and Back Flaps....revised list, dis 30 %
Wrought Narrow Butts....reduced, dis 30 %
Can Openers—Sprague's....dis 50 %
No. 1, Iron Handle....$4·00
No. 2, Wood Handle....4·50
Cards.—
Curry Cards, No. X, per doz., $0·35....dis 30 %
Horse " No. X, " 0·80....dis 30 %
Wool " No. 8X, " 2·50....dis 15 %
Cotton " No. 10, " 3·50....dis 10 %
Cartridges.—U. S. Cartridge Co....dis 60 %
Chisels.—"Buck Bros.' Shank Goods....add 22½ %
Socket....add 25 %
Churns.—Lightning—
Redheffer patent.... 3 4 5 6 gall
per doz $22 00 $27 00 $31 50 $36 00
Coal Hods....dis 40 %
Fancy Japanned, No. 4, 15 in., $8·00; 5, 16 in., $9·00; 6, 17 in., $10·00.
Fancy Galvanized, No. 4, 15 in., $11·50; 5, 16 in., $13·00; 6, 17 in., $14·00.
Perfection, Jap'd, No. 4, 15 in., $12·00; 5, 15 in., $13·00; 6, 17 in., $14·00.
Perfection, Galv'd, No. 4, 15 in., $15·00; 5, 16 in., $16·00; 6, 17 in., $17·00.
Morning Glory, Jap'd, No. 4, 15 in., $12·00; 5, 16 in., $13·00; 6, 17 in., $14·00.
Morning Glory, Galv'd, No. 4, 15 in., $15·00; No. 5, 16 in., $16·00; No. 6, 17 in., $17·00.
Compasses and Dividers.—Bemis'....dis 40 %
P. S. & W....dis 30 %
Cordage.—Manila (usual trade dis.)....℔ 14½c
American Tarred Hemp Lath Yarn....℔ 10c
Corn Hooks....per doz $2·75
Cow Ties....dis 10 %
No. 30, Open Ring, 3 foot, No. 6, with Toggle....$3·70
No. 35, " 3 " No. 6, " Snap....3·90
No. 40, " 3½ " No. 6, " Toggle....4·00
No. 45, " 3½ " No. 6, " Snap....4·30
No. 50, " 4 " No. 5, " Toggle....4·70
No. 55, " 4 " No. 5, " Snap....4·80
No. 60, " 4½ " No. 4, " Toggle....5·20
No. 65, " 4½ " No. 4, " Snap....5·40
Crow Bars.—Iron, Steel Points....℔ 5½c
"Sweet" Steel Bars....℔ 11c
Brown's Steel Bars....℔ 10c
K. P. & Co. Extra Drill Steel....℔ 15c
Dividers.—Cook's Nickel Plated....dis 15 %
Door Springs.—Stimson's Patent.—
No. 7, Light inside doors, $12·00....dis 25 %
No. 8, " outside " $18·00....dis 25 %
Torrey's....$3·00
Gem....1, $3 50; 2, $2 50; 3, $2 00 ℔ doz
Egg Beaters.—Lightning, Redheffer pat., pints, $5 50; 1 qt., $8 00; 2 qts., $12 00 per doz.
Emery.—Alden....℔ 6½c
Wellington Mills....℔ 10c
Files.—Earl Smith & Co.'s English....$5 to £ gold
American....$5 to £ currency, less 15 %
Nicholson....new net list
Wheeler, Madden & Clemson....$5 to £
Stubb's Tapers, genuine, 3 in., $1·50; 3½, $1·62; 4, $1·88; 4½, $2·13; 5, $2·50.
Funnel Irons.—$2·50 2·50 2·50 3·25 per doz
5, 5½, 6, 7 inch.
Deep Flange.—$3·50 3·75 4·00
5, 5½, 6 inch.
Hammers.—Maydole....dis 12 %
M., B. & D., solid cast steel, adze eye, No. 1, $10; 1½, 8·75
" " " " " " bell face, No. 1, $11; 1½, $9·75.
Hangers & Rollers.—Novelty....dis 30 %
Anti-Friction....$1 75 per pair—dis 20 %
Hatchets.—Underhill Edge Tool Co....dis 15 %
C. F. Dowse, warranted Cast Steel—
Shingling....0, $4·75; 1, $5·25; 2, $5·75
Claw....1, 5·75; 2, 6·25
Lathing....1, $5·50
Axe Pattern....1, $7·00; 2, 7·50
Broad....0, $5·75; 1, $6·50; 2, $7·50; 3, $9·25; 4, $10·75; 5, $12·75; 6, $14·75
Hinges.—Strap and T, Stanley Works....dis 40 %
Plate, Loose and Fast Joint....℔ 6c
Wrought Screw Hook....℔ 6½c
Knobs.—Young's Imp. Silverd Glass....dis 45 %
Lanterns.—Tubular No. 0....$ 9·50
Guarded, No. 71, (with kerosene oil and candle burners)....5·50
Anti-Tubular....8·00
Lead.—Sheet, 9½c.; Pipe, 9c....less 10 %
Locks.—Norwalk Lock Co....reduced list, dis 40&5 %
Mattocks.—
K. P. & Co., axe finish, long cutter....$13 00—net
Short cutter....12 75—net
Meat Cutters.—"Miles's" Challenge....dis. 20 %
No. 1, $22·00; 2, $30·00; 3, $40·00.
Metal.—Babbitt, No. 1, 35c; 2, 25c; 3, 16c; 4, 15c ℔
Nails.—10d and larger....$3 25 net
Nail Pullers.—Little Giant—Small....per doz., $22·00
Little Giant—Large...." 30·00
Padlocks.—Wilcox....reduced list, dis 40&5 %
All Brass, 2½ inch, 2 keys, job lot....$9 00
Paper.—Tar'd Sheathing....℔ 2 c
Dry Sheathing...." 3 c
" " "Beaver Brand" Rosin Sized...." 3½c
Tar'd " " "...." 3 c
Felt " " "...." 4½c
Virginia Cane Fibre....4½c
Picks.—K. P. & Co., Solid Eyes....5 to 6 6 to 7
$9 00 $9 50
Pins.—Universal Hat and Coat all wood—
2 in....℔ gross $2 50; 3 in., 3 50; 4 in., 4 50—dis 15 %
Potato Digger.—
"Partridge," 6 square tine....℔ doz $12 00
Shumway & Co., 6 round tine....℔ doz 9 00
Pulleys.—Axle.
Frame Pol. Wheel....No. 150, 30c., 1½ in.; 16, 38c., 2 in.
Common Axle....No. 18, 34c., 1½ in.; 26, 40c., 2 in.
Milled Axle....No. 2, 42c., 1½ in.; 3, 50c., 2 in.
Nashua Pat. Axle Bronzed Face....1½ in., 60c; 2 in., 90c
Cast Steel Axle....2 in., $1·00
Pulley Blocks.—"Best Boston Make"....net

Common Strapped Blocks—

	4	5	6	7 inch.
Single,	75c.	88c.	$1·00	$1·13 each.
Double,	$1·00	1·12	1·25	1·60 "

Inside Iron Strapped Blocks—

	5	6	7	8	9	10 inch.
Single,	$1·00	1·13	1·35	2·00	2·25	2·75 each.
Double,	1·88	2·30	2·63	3·63	4·00	5·00 "

Inside Iron Strapped Blocks, with Patent Roller Bushings—

	5	6	7	8	9	10 inch.
Single,	$1·25	1·50	1·65	2·50	2·75	3·50 each.
Double,	2·50	3·00	3·38	4·63	5·00	6·50 "

Plated Ware.—Rogers Bros....dis 50 %
Plumb & Levels.—"Davis" Pat. Adjustable—
No. 1, Iron and Wood Center Levels....dis 50 %
No. 2, First Quality Levels....dis 60&10 %
No. 3, Iron Pocket "....dis 35 %
No. 4, Level and Plumb Glasses....dis 60&10 %
No. 5, Iron Pocket Levels, per square and straight edge....dis 50&10 %
No. 6, Improved Iron Bench Planes....dis 20&10 %
Pocket Knives.—Conn. Cutlery Co....new net list
American Shear Co....new net list
Rail Barn Door.—For Novelty and Anti-Friction Hangers....per foot 7c., dis 30 %
Rivets.—Black....dis 25 %
Carriage, oval head, Nos. 3, 4, 5, 6, 7, 8, dis 7½ %
13 13 14 14 15 16c ℔
Rubber Moldings.—"Harmon's"....dis 10 %
No. 2, for Windows....per foot, 5c
No. 3, for Doors....per foot, 10c
No. 4, "....per foot, 12c
Sad Irons.—Bless & Drake....℔ 4c
Sand Paper—0 to 2, $4·25; 2 to 3, $4·75....dis 10 %
Saws.—*Hand and Panel*—
Wheeler, Madden & Clemson's, same list as "Disston's"....dis. 15&5 %
Disston's....dis. 12½ %
Cross Cut—
Wheeler, Madden & Clemson X Cuts....per ft., 37c
" " "Star" X Cuts. " 60c
" " " Champion X Cut. " 50c
" " " One Man X Cut..each, $2·25
Boynton's genuine Lightning X Cut....per ft., 50c
" " " One Man X Cut..each, $2·00
Circular—Wheeler, Madden & Clemson's....dis. 25 %
Mill— " " "....dis. 25 %
Screws.—Am. Screw Co., new list Sept. 1st....dis 30 %
Aiken's....dis 30 %
Scythe Stones.—
"Willoughby Lake," first quality....℔ gross $6·50
" second quality...." 3·00
Shovels.—O. Ames....dis 20 %
M. B. & D....dis 20 %
Snow, Malleable Iron Tip, D Handle—Agents for New England....$6·50
Snow, Malleable Iron Tip, long Handle—Agents for New England....5·50
Sifters.—Coal, Rice, &c....$12 00
Spading Forks.—M. & E....dis 25 %
Stone Pickers.—"Partridge," original....℔ doz $15 00
Tools.—Aiken's Pattern, 20 in set; Parr's..$7 5) per doz
Traps.—Oneida....dis 25 %
Blake's....dis 50 %
Vises.—K. P. & Co.'s Solid Box, Blacksmith....℔ 13c
Parker's Parallel....dis 10 %
Backus....dis 25 %
"Howards," Parallel....dis 20 %
Wardrobe Hooks.—Wire to drive....℔ gross $1 00
Weather Strips.—"Harmon's"....per doz $5, dis 10 %
Weights.—Window Weights....℔ 2c
Wedges—Axe....℔ doz 38c
Wire.—
Eureka, in spools, No. 28 to 40 assorted....℔ gross $3 50
Wire Netting.—Clinton Wire Cloth Co., Green, Drab or Black....℔ ft 5½c
Wrenches.—Genuine Wrenches, G. A. Coes..dis 40&5 %
Walton....dis 50 %
Wringers.—
{Novelty and Universal} Tub No. 2 {....Less than doz, $72 00; ....2 doz or more, 70 00}
Bench A... less than 2 doz $86 00; 2 doz or more $84 00
" B... " " 94 00 " " 92 00
" C... " " 110 00 " " 107 00
Eureka.... " " 60 00 " " 58 00
Withington, Cooley & Co.—
Hoes, Rakes, Forks, &c....dis 33⅓ %

Boston Metal Market.

(Corrected by Fuller, Dana & Fitz, 110 North Street, Boston, Importers and Commission Merchants.)

September 1, 1875.

Iron.—Best Refined Bar Iron....℔ ton $57 50
"Burden Best" " "...." 95 00
Swedish Bar Iron....gold " 110 00
Norway Shapes....gold " 122 50
Norway Nail Rods....gold " 130 00
Sheet Iron, American....℔ 4½c
" " Galvanized...." 9 c
" " Russian....gold " 13½c
Plate Iron, C. No. 1...." 3½c
Iron Rails....℔ ton $50 00
Steel Rails...." 75 00
Pig Iron, Foundry, No. 1 extra...." 27 00
" " No. 2 extra...." 25 00
" Gray Forge...." 23 00
" Scotch...." 30 00 @ 32 00
Wrought Scrap Iron...." 31 00
Old Rails...." 28 00

Steel.—	℔	German....℔	9½c
Eng. Tool, gold	15½c	Spring....	5 c
American Tool	14½c	Tire....	6 c
" Mach	9½c	Sleigh Shoe....	4½c
Bessemer....	7 c	Toe Calk....	7½c
Tin Plates.—℔ box gold		**Copper.**—	℔
I. C. Char. 10x14	$7·75	Ingot....	23½c
I. C. Coke 10x14	7 00	Bolt....	30c
Char. Roof. IC. 14x20.	7 25	Sheathing....	30c
Coke " IC. 14x20.	6 25	**Lead.**—	℔
METALS.		Pig....	7½c
Pig Tin.—℔., gold		Sheet & Pipe....	8 1-10c
Banca....	21c	**Zinc.**—Sheet..℔	10½c
Straits....	19½c	**Spelter.**....℔	7½c
English....	19½c	**Antimony.** gold ℔	13½c

ST. LOUIS.

Corrected weekly by Semple, Birge & Co.

Apple Parers.—Conqueror....℔ doz, $7 75
Hudson's Rotary...." 7 75
Axes.—Wm. Mann's, Red Warrior....℔ doz $11 50
Wm. Mann's, W. Stewart's....12 00
" C Marshall...." 10 50
" Handled...." $5 extra
" Double Bitted...." 2. 50
H. L. B. & Co.'s, L. & Co...." 11 50
" Pioneer...." 12 00
" James & Co...." 11 00
Hunt's...." 12 00
Axles.—"Jones, Henry & Co.'s" Patent Lubricating, Half Patent, Swelled Taper, Plain Taper and Concord Axles....dis 10 & 5 %
Common Axles (Pat. Lubricating), 1½ inch and upward....℔ 6½c.
do. less than 1½ inch...." 7 c.
Bellows.—Best St. Louis make..60c ℔ in. dis 20&2½ %
Bells.—Troy, Church, School and Farm Bells..℔ 44c
"Improved Amalgam Bronzed." 15 in., $3·00; 17 in., $4·00; 19 in., $6·00....net
Belting.—"Boston Belting Co.'s Rubber....dis 40 %
"Bradford & Sharp's" Oak-Tanned Leather....dis 30 %
Bolts.—Arms, Bell & Co.'s Carriage & Tire..dis 70&10 %
Arms, Bell & Co.'s Machine....dis 30&10 %
Butts.—Western Butt Co.'s new list—
Narrow Fast Joint....dis 25&10 %
Broad Fast Joint....dis 3 &10 %
" Loose "....dis 45&10 %
Reversible....dis 40&10 %
" Japanned and Silver Tipped....dis 45&10 %
Loose Joint "Acorn" " "....dis 45&10 %
Wheeling Hinge Co.'s W't Fast Joint Nar....dis 30 %
" " " Broad....dis 35 %
" " Loose Joint....dis 35 %
" " Reversible....dis 35 %
" " Table & B'k Flaps....30 %
Churns.—Julian, No. 2, $7·00; No. 3, $7·50; No. 4, $8·50....dis 25 %
Cider Mills.
American Senior, $40·00; Am. Junior, $25·00....dis 20 %
Corn Knives.—Dunn Edge Tool Co.'s Clip....℔ doz 5 00
Seymour Mfg. Co.'s Solid Steel Back...." 4 00
Corn Shellers.—Sandwich Mfg. Co.'s—
Power Shellers....dis 10 %
Hand Shellers....Special rates
Cotton Gins.—The Carver, 10 in. Saw, $4 a Saw..dis 15 %
12 in. Saw, $4·50 a Saw....dis 10 %
Crow Bars.—Steel Pointed....℔ 6½c
Drag Saw Machines.—
Culver's Iron Drag Saw....dis 10 %
Robinson's Patent Sweepstakes Drag Saw....dis 10
Fanning Mills.—Nash & Cutt's....dis 20 %
Feed Cutters.—Improved Burdick National....dis 20 %
Sanford No. 1, $10 75; No. 2, $8 00....net
Files.—Black Diamond, Mill....$5·00 £ currency.
" Bastard....5·00 £ currency.
" Taper....5·00 £ currency.
Forges.—Keystone Portable Forge Co.'s....dis 12½ %
Forks and Hoes.—
Auburn Mfg. Co.'s Hay and Manure Forks....dis 10 %
" " Handled Hoes....dis 30 %
Garden Seed Drills and Wheel Hoes.
Allen's Double Wheel Hoe....dis 15 %
" Planet Drill, Nos. 2 and 3....dis 15 %
" Combined Drill and Wheel Hoe....dis 15 %
Grinding Mills.—Challenge Feed Mills....dis 15 %
Sedgebeer's Nonpareil Mills....dis 15 %
Hammers.—Masons' Hammers....℔ 20c
Smiths' Hand....20c
Handles.—No. 1 Fork, Hoe and Rake....dis 20 %
No. 2 Fork, Hoe and Rake....dis 40 %
Harrow Teeth.—1 inch Iron....℔ 4½c
⅞ and ¾ inch iron....4½c
Barbed or Headed....½c extra
Hay and Cotton Presses.—
Dederick's Railroad....net list
" Perpetual....net list
Hay Knives.—
Dunn Edge Tool Co.'s....℔ doz $15 00—dis 15&5 %
Lightning (Weymouth's Patent)....℔ doz $20 50
Hinges—
Wheeling Hinge Co.'s Strap & T....dis 33⅓&10 %
Horse Hay Fork.—Nellis' Harpoon....dis 15 %
Horse Nails.—National Patent Pointed....20c rates
National Patent Pointed, extra finished....24c "
Horse Powers.—Pitts or Carey's Patent....dis 10 %
Wheeler's Railway....dis 10 %
Sandwich Lever....dis 10 %
Horse Rasps.—Heller Bros....dis 45 %
"Black Diamond"....$6·00 to the £ currency
Horse Shoes.—
Rhode Island (Perkin's Pattern)....℔ keg, $5 50
" Mule...." 6 30
" Trotting Shoes...." 8 00
Tredegar Horse....per keg $5 50
" Mule....per keg 6·50
Hose.—
Boston Belting Co.'s Rubber Medium Sizes, dis 30&10 %
" " " Small Sizes, Hydrant....dis 40 %
Ice Tools.—W. T. Wood & Co.'s Saws....new list net
W. T. Wood & Co.'s Chest Hatchets....new list net
" " Axes....new list net
" " Loading Tongs....new list net
" " Medium, Small and Family Tongs....new list net
" " Chisels, Hooks and Grapples....new list net
Mattocks and Grub Hoes.—
Klein, Logan & Co.'s Mattocks....℔ doz $13 00 @ 15
" " Grub Hoes, oval eye...." 10 00 @ 14 50
Money Drawers.—
Pierpont & Co.'s Excelsior....per doz $40·00 net
Nails.—Wheeling....$3 15 rates
Packing.—Boston Belting Co.'s Rubber, Plain..dis 30 %
Boston Belting Co.'s Rubber, Pure....dis 25&5 %
" " No. 2 Plain....dis 40 %
" " Round and Square....dis 10&10 %
Picks.—Klein, Logan & Co.'s Railroad and Clay....℔ doz $9 30 @ 11 00
Klein, Logan & Co.'s Coal...." 7 45 @ 8 40
" " Poll...." 12 60 @ 13 50
" " Stone...." 14 40 @ 14 90
" " Tamping...." 14 75 @ 15 35
" " Miners' Drifting...." 10 25 @ 12 90
Plows.—Avery's Cast and Steel....dis 20 %
Collins Cast Cast Steel....new list net
Pekin Steel....new list net
Post Hole Augers.—Clark's Patent—
No. 1, ℔ doz. $27; No. 2, $30; No. 3, $32....dis 20 %
Pulleys.—5 inch....per doz $4·25 net
4 inch....per doz 3·25 net
Nellis' Patent....new list dis 15 %
Pumps.
St. Louis, Farm, Patent Metal Lined...new list dis 50 %
Rakes.—Paddock's Premium Sulky....$28 00 net
St. Louis Revolving 14 tooth....4 65 net
" " 16 "....4 90 net
" Hand Hay Rake....dis 20 %
Reaper Knives and Sections.—
Geo. Barnes & Co.'s Knives....dis 25 %
" Sections....dis 40 %
Road Scrapers.—Steel....dis 25 %
Cast Iron....dis 10&5 %
Sad Irons.—Monitor Brand, Silver Polished..℔ 4½c
Sash Weights.—Standard Solid Eyes....℔ 4c
Saws.—Curtis & Co....dis 10 %
Scythes.—Dunn Edge Tool Co.'s....new list dis 20&5 %
Scythe Stones.—No. 1 Ind'n Pond ℔ gr's, $7 00 }
Extra Indian Pond...." 7 50 }
Premium...." 10 50 } dis 25 %
Diamond Grit...." 18 00 }
Shovels and Spades.—Myers & Armor....dis 15 %
O. Ames & Son....dis 12½ %
Grain Scoops, Pat. Corrugated Straps M. & A. dis 15 %
" " " T. Rowland's dis 15 %
" " " O. Ames & Son dis 12½ %
Sledges.—Smith's Stone or Coal Sledges—
Steel Face Polished....℔ 15c
Solid Cast Steel...." 35c
Snaths and Cradles.—Seymour Mfg. Co.'s..dis 20 %
Sorghum Machinery.—Bell Cane Mills....dis 15 %
Scantlin's Seamless Evaporators....dis 10 %
Springs.—Cleveland Spring Co.'s—
Carriage and Express....dis 12½ %
Blue Seat Springs....dis 15 %
Vises.—Solid Box....℔ 16c
Wilson Mfg. Co.'s....dis 15 %
Wheelbarrows.—Railroad & Garden....new list net
Wrenches.—Coes' Genuine....dis 28½ %
Coes' Pattern....dis 50
Wagons.—Whitewater Farm Wagons—
Thimble Skein....No. 3, $74; 3¼, $78; 3½, $79
Iron Axle....No. 1½, $75; 1⅝, $81; 1¾, $89

St. Louis Metal Market.

(Corrected Weekly by Messrs. R. Sellew & Co.)

Tin Plate.

IC, 10x14, Best Char..	$ 9·50	IX, 14x20, Roofing....	$11·50
IX, 10x14, "	12·00	IC, 20x28, "	19·00
IC, 12x12, "	10·00	IX, 20x28, "	26·50
IX, 12x12, "	12·50	IC, 10x14, Coke...$	8·50 @ 9·00
IC, 14x20, "	10·00	IC, 14x20, "	9·00
IX, 14x20, "	13·00	IC, 10x20, "	14·00
IC, 14x20, Roofing....	9·00		

Usual difference for odd sizes.

Block Tin.
Large Pigs....25c | Bars....27c
Small " L. & F....26c |

Sheet Zinc.
Casks....℔ 10½c | Sheet....℔ 11c

Solder.
No. 1, Refined, in bars or plate....16c
No. 2, " " "....15c
Pig Lead....7½c

Sheet Copper.—14 to 100 lbs. Sheets 30x60....31c
10 to 12 lbs., " " and 20x72....32c
6 to 9 lbs., " "....35c
Tinned, 14 and 16 oz. 14x48....33c
Planished, 14 and 16 oz. 14x48....39c
" No. 7, 8 and 9....41c
Copper Bottoms....34c

Sheet Iron -	Com'n.	Sm'th.	Char'l.	Jun'ta
No. 16 to 20....	4½c	4½c	6½c	7½c
No. 22 to 24....	4½c	4½c	6½c	7½c
No. 26....	4½c	5 c	6½c	8 c
No. 27....	4½c	5½c	6½c	8½c

Galvanized Iron....dis 30 %
Iron Rivets....dis 25 %
Iron Wire....dis 35 %
Coppered Pail Bail Wire....dis 10 %
Copper Rivets and Burs....dis 20 %
Genuine Russia Iron.
Perfect—No. 9, 10, 11, 12....per lb. 17c
Stained—No. 9, 10, 11, 12....per lb. 16c
Tare 22 lbs to Bdle. For less than 1 Bdle. add 1c. ℔ #.
Retinned Stamped Ware....dis 20 %

CHICAGO.

(Reported by Frank Sturges & Co., 72, 74 & 76 Lake St.)

September 10, 1875.

Tin Plate.—

10x14, IC, Ch'l. Good.$		14x20, IX, Ch'l Best.$	13 00
10x14, IC, " Best.	9 50	14x20, IXX, " " .	15 50
10x14, IX, " " .	12 00	14x20, IXXX, " " .	16 00
12x12, IC, " " .	10 00	DC, 100 Plate, " " .	9 50
12x12, IX, " " .	12 50	DX, " " .	12 00
14x20, IC, " " .	10 50	DXX, " " .	14 50
		DXXX, " " .	17 00

Roofing IC, Charcoal, Best....9 00
Roofing IX, Charcoal "....11 50
20x28, IC, Charcoal Roofing, Com....18 00
20x28, IC, " Good....18 50
20x28, IC, " Best....19 00
20x28, IX, " "....23 50
10x14, IC, Coke Plates....8 50 to 8 75
14x20, IC, "....9 00 to 9 50
10x20, IC, "....14 00

Block Tin.—
Large Pigs....27c | Bars....30c
Small....28c |

Zinc.—Sheet, 500 to 1000 lb. Casks....10½c
Loose Sheets....11c
Slab Zinc or Spelter....7½c

Copper.—Bottoms....34c
Sheathing....32c
Planished....39c
" Boiler lengths....41c
Ingot....—
Bolt....33c

Braziers' Sheets.—
30x60, 6 & 7 lbs....℔ 38c | 30x60, 10 & 12 lbs...℔ 35c
30x60, 8 & 9 lbs...." 37c | 30x60, 15 to 100 lbs...." 32c

Solder.—F. S. & Co.'s make.
Best Fine....20c
No. 1....19c
Roofing....17c
Braziers' or Spelter Solder....35c

Antimony....18c
Babbit Metal—F. S. & Co.'s....18c
No. 2....14c

Sheet Iron.—

	Common.	Smooth. Com.	Smooth Charcoal.	Smooth Juniata
No. 24....	4½c	5½c	6½c	8½c
25 & 26....	4½c	5½c	7 c	9 c
27....	4½c	6 c	7½c	9½c

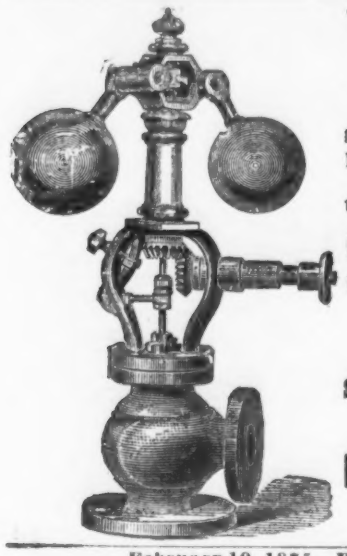
Galvanized Iron....dis 30 %
No. 16 to 20....14c | No. 27....15c
21 to 24....13c | 28....16c
25 & 26....14c |

Russia Iron.—
Perfect....17c | No. 1 Stained....16c
| In Sheets, 1c. higher.

American Russia.— | B....11c
A....14c | In sheets, 1c higher.

Lead.— | Lead Pipe, in full coils .8½c
Pig....7½c | Lead Pipe, when cut...8¾c
Bar....8½c | Sheet Lead....9½c

Wire—Bright....dis 30 %
Coppered....dis 30 %



TO ALL WHO USE STEAM-POWER!

We will put our Governor on any Engine, and guarantee it to prove itself superior to all others.

If, after a fair trial, it does not, we will take it off at our own expense.

Shive Governor Co

BETHLEHEM, PA.

ALSO,

SHIVE'S PATENT WATCHMAN'S CLOCK AND DETECTOR,

AND

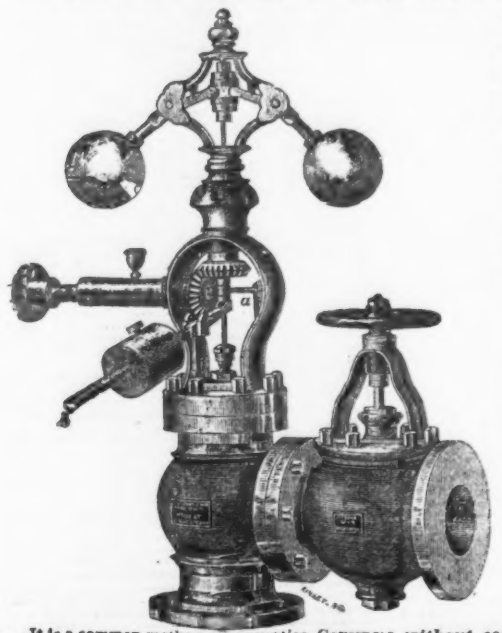
Buoy's Patent Counter Scale.

No Nest of Weights.

Circulars sent free

February 10, 1875. REDUCED PRICE LIST OF THE

JUDSON PATENT IMPROVED GOVERNORS.



☞ When Governors are ordered, be particular and say Governor with Stop Valve, or without Stop Valve; and either Black, Finished or Portable, as you may require, and with or without Lever Attachment.

For dimensions and other particulars send for Illustrated List.

Capacity of Valve or Diameter of Steam Pipe in Inches.	Price, Black.	Price, Bright Finish.	Price, Portable.	Price of Lever Attachment for altering speed.	Price of Stop Valve.
¾	18·00	20·00	17·00	..	..
¾	20·00	22·00	19·00	..	..
1	24·00	27·00	22·00	2·00	5·25
1¼	29·00	32·00	27·00	2·25	6·50
1½	34·00	38·00	31·00	2·50	8·50
2	41·00	46·00	38·00	2·75	11·50
2¼	47·00	54·00	..	3·25	16·00
2½	50·00	57·00	47·00	3·50	17·00
2¾	55·00	62·00		3·75	19·00
3	62·00	70·00		4·25	22·00
3¼	71·00	80·00		4·50	27·00
4	81·00	92·00		5·00	32·00
4¼	91·00	103·00		5·50	37·00
5	103·00	114·00		6·00	42·00
5¼	116·00	129·00		6·50	48·00
6	134·00	148·00		7·00	55·00
7	160·00	176·00		8·00	69·00
8	199·00	219·00		9·00	83·00
9	230·00	255·00		10·00	..

No Larger Portable made than 2½ in.

No Charge for Boxing & Cartage.

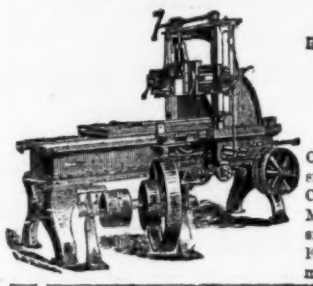
It is a common method to advertise Governors *without cost*, unless satisfactory to the customer, and then charge *High Prices* for doing what any good Governor will do. Various Governors inferior to the "Judson" are sold in this way, operating well enough for three months, to insure collection of the pay, but becoming useless after a year's wear—their construction lacking durability. The Judson Governor is guaranteed to be not only the best Regulator of Steam Engines, but also the most durable Governor made. Parties in buying other Governors should stipulate that their durability be guaranteed, and should also take care that they do not, for much inferior Governors, pay higher prices than those shown in the above list. We guarantee the Judson Governor will do all any other Governor can do, and in Accuracy and Durability—the main essentials—we guarantee it shall do more.

JUNIUS JUDSON & SON, Rochester, N. Y.

The Pratt & Whitney Co.,

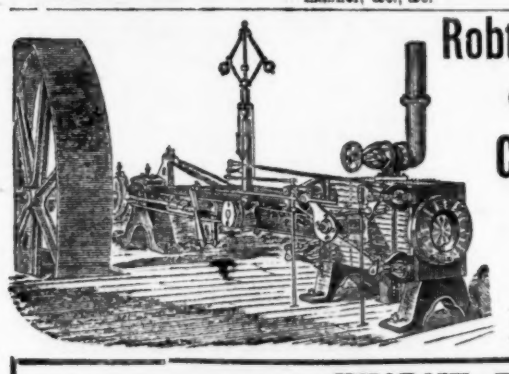
Hartford, Conn.,

Have constantly on hand and making



Drop Hammers

Of recently Improved Construction. Pony Trip Hammers, Blacksmiths' Sheaves, Broaching and Stamping Presses, Iron Shop Cranes, Machinists' Tools, Gun and Sewing Machine Machinery. Make to order Gray and Charcoal Iron Castings of all styles and sizes not exceeding 15 tons weight, (making patterns if desired). Furnish Clamp Pulleys of light patterns, cut gears in a superior manner, &c., &c.



Robt. Wetherill & Co

CHESTER, PA.

Corliss Engine BUILDERS

AND

Boiler Makers.

THORNE, DeHAVEN & CO.

21st Street, above Market, PHILADELPHIA.

DRILLING MACHINES.

PORTABLE DRILLS. Driven by power in any direction, self-feed and convenient adjustment.

RADIAL DRILLS. Self-feed—large adjustable box table—separate base plate, every convenience.

VERTICAL DRILLS. Self-feeding—of new and improved designs.

MULTIPLE DRILLS. For boiler work, etc., 2 to 20 spindles, fed and returned by power or hand, together or separately.

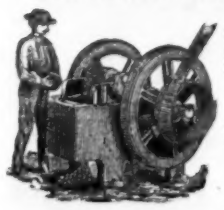
HORIZONTAL BORING AND DRILLING MACHINES. For large pieces—with boring head, adjustable, vertically and horizontally.

SPECIAL DRILLS. For special work. Gun Blank Drills, Coal Drills, &c., built to order.

BLAKE'S PATENT

STONE & ORE BREAKER.

New Pattern with Important Improvements & Abundant Strength



For reducing to fragments all kinds of hard and brittle substances, such as STONE for making the most perfect McADAM ROADS, and for making the best CONCRETE. It breaks stone at trifling cost for BALLASTING RAILROADS It is extensively in use in MINING operations, for crushing

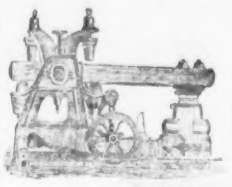
IRON, COPPER, ZINC, SILVER, GOLD, and other ORES.

Also for crushing **Quartz, Flint, Emery, Corundum, Feldspar, Coal, Barytes, Manganese, Phosphate Rock, Plaster, Soapstone, &c.**

For Illustrated Circulars, and particulars, address,

BLAKE CRUSHER CO., New Haven, Conn.

BRADLEY'S CUSHIONED HAMMER



Has Larger Capacity,

Is More Durable, takes up Less Room, does More and Better Work with less expense for Power and Repairs than any other Hammer in use.

GUARANTEED as RECOMMENDED.

Address, BRADLEY MANUFACTURING CO., Syracuse, N. Y.

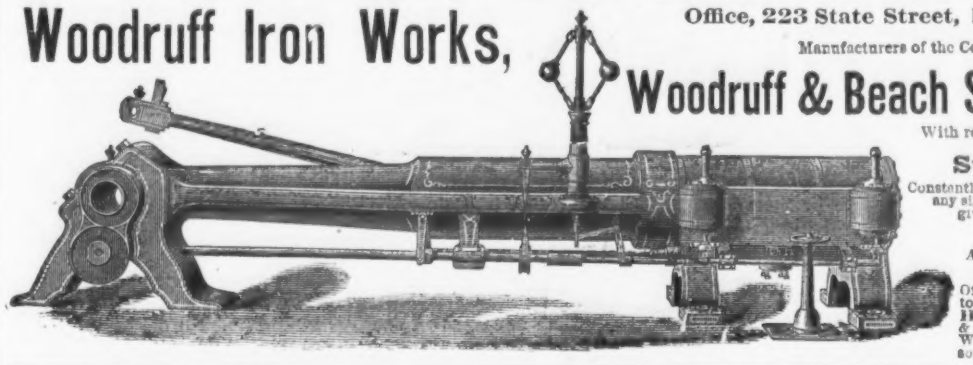
Woodruff Iron Works,

Office, 223 State Street, Hartford, Conn.

Manufacturers of the Celebrated

Woodruff & Beach Steam Engine,

With recent valuable improvements.



Steam Boilers

Constantly on hand and made to order any size or style. Special attention given to the manufacture of

MILL WORK

And all kinds of Machinery.

CASTINGS

Of any size or style. Direct all letters to **The Woodruff Iron Works, Hartford, Conn.**, as the Woodruff & Beach Iron Works and firm of Woodruff & Beach are both dissolved.

Knowles Patent Steam Pumps

MANUFACTURED BY THE

KNOWLES STEAM PUMP WORKS,

WARREN, MASS.

WAREHOUSES:

14 & 16 Federal Street, Boston, 92 & 94 Liberty Street, N. Y.

Cut above represents regular Boiler Feed Pump, No. 3 and 4. Showing New Patent Valve Motion, and Hand Power LEVER Attached and Detached.

FIRE PUMPS, a specialty.

Mining Pumps (both Double Acting Plunger, and Piston Pattern,) which we guarantee to run absolutely noiseless on any lift from 100 to 600 ft., at a single lift, a specialty. Pumps for every possible duty. Prices as low as any, and our workmanship and material altogether the Best.

Every machine furnished under a complete guarantee.

Morse Twist Drill and Machine Company,

New Bedford, Mass. Sole Manufacturers of

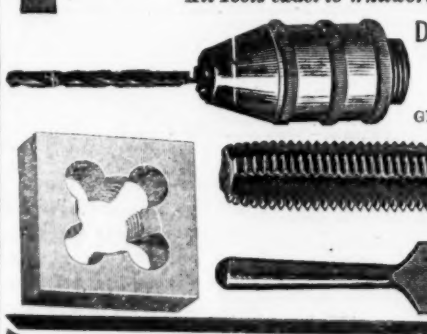
MORSE PATENT STRAIGHT-LIP INCREASE TWIST DRILL.

Beach's Patent Self-Centering Chuck.

Also Manufacture **Patent Taps and Dies, Patent Screw Plates, Patent Tap Wrenches, Pipe Taps and Pipe Reamers, Gas Dies.**

SOLID AND SHELL REAMERS.

All Tools exact to Whitworth's Standard Gauge.



Drills made to fit any Socket desired.

EDWARD S. TABER, Treas.
GEO. R. STETSON, Supt.

Machinery without Lubricant

METALINE.

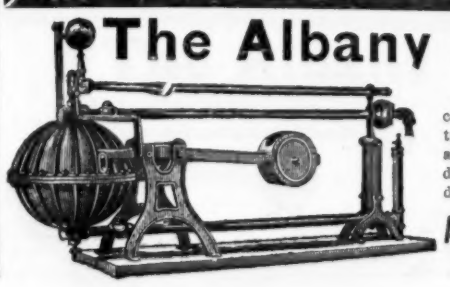
Machinery Metalined, or Metaline furnished to Machine Builders.

No oil or attention required. Runs with little or no wear No dirt or danger from fire. No damage to goods in process of manufacture. Years in use by best concerns, who are refitting old, and ordering new machinery to be metalined.

AMERICAN METALINE COMPANY,

61 Warren Street, New York City.

The Albany Steam Trap.



This Trap automatically drains the water of condensation from *Heating Coils*, and returns the same to the Boiler *whether* the Coils are *above or below* the water level in Boiler, thus doing away with pumps and other mechanical devices for such purposes. Apply to

Albany Steam Trap Company,

Albany, N. Y.

Whittier Machine Co.,

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Manufacturers of

STEAM ENGINES, BOILERS, ELEVATORS and MACHINERY.

This Company has just received **the highest award, a Gold Medal, for Safety Elevators,** from the Massachusetts Charitable Mechanics Association.

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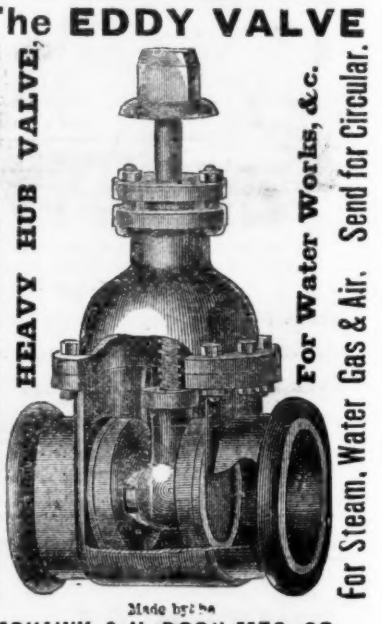
The EDDY VALVE

ALL SIZES HAVE DOUBLE GATES. HEAVY HUB VALVE, For Water Works, &c. For Steam, Water Gas & Air. Send for Circular.



Made by the

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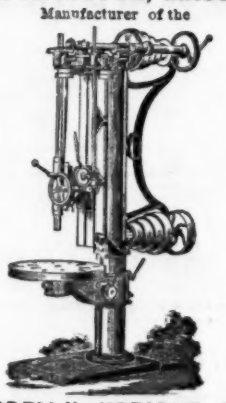
Waterford, N. Y.

Four miles from Troy, N. Y., by steam or horse cars.

P. BLAISDELL & CO.,

WORCESTER, MASS,

Manufacturer of the



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And other First-Class Machinists' Tools.

Patented Steam and Hydraulic, April 1, 1868.

EAGLE PACKING,

Of various sizes for **ENGINES and PUMPS** manufactured by JAMES GLANDING & CO., No. 115 Queen St., Philadelphia. What the proprietors claim for the Eagle Packing: 1. Its general adaptation to all purposes for which packing is used. 2. Its durability. It will outlast any other article in use. 3. Its cheapness. It can be furnished to the consumer at a lower rate than any other packing.

Machinery, &c.

THE

Shapley Engine

Patented Feb. 10, 1874.

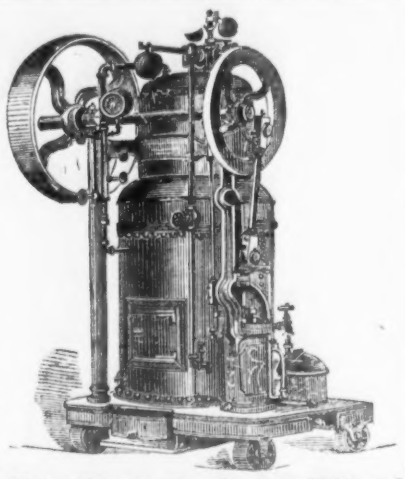
COMPACT,
PRACTICAL,
DURABLE,
ECONOMICAL.

$200·00.

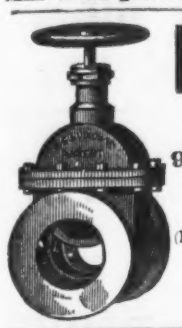
Cheaper than any Engine offered of the same capacity.

MANUFACTURED BY

SHAPLEY & WELLS,
Binghamton Iron Works,
Binghamton, N. Y.



Manufacturers of **Steam Engines, Boilers, Water Wheels, Circular Saw Mills and Mill Work generally.**



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938 to 954 River St. & 67 to 83 Vail Ave., Troy, N. Y.,

VALVES

(Double and Single Gate, ¼ in. to 48 in.—outside and inside Screws, Indicator, &c.) for Gas, Water and Steam. Send for Circular.

Also FIRE HYDRANTS.

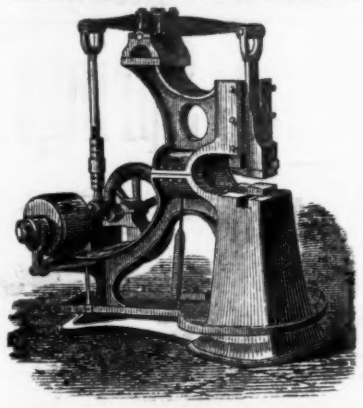
Cor. N. 15 St. & Pennsylvania Ave., Phila.

E. HARRINGTON & SON,
Manufacturers of

ENGINE LATHES,

From twelve (12) to forty-eight (48) inches swing;

Hand Lathes; Wood Turning Lathes; Vertical Drills; Boring Mills; Tapping and Centering Machines; Screw Press for Mandrels Grindstone Boxes.



THE PALMER POWER SPRING HAMMER.

Of these Machines we are building sizes to meet the requirements of all Manufacturers and Workers of Iron and Steel. In simplicity, durability, ease of operation, accuracy, and range of work, we guarantee them superior to any Machines of their kind produced in the world. For prices, references, and full descriptive circulars, address

S. C. FORSAITH & CO.,

Manchester. N. H.

WILSON MANUFACTURING COMPANY.,

NEW LONDON, CONN.

MANUFACTURERS OF

SOLID BOX VISES.

With or without Convex and Concave Washers.

Jackscrews, Braces, Coffee Mills, Turning Lathes, Clamp Heads and Screws, Parallel Bench Vises, Sash Pullies, Hoe, House Pullies, Composition Cocks, Bench Screws, Vise Screws, Gridirons, Drill Stocks and Bows, Box Chisels, Rivets, Sheaves, Block Pins, Composition Roller and Iron Bushings, Riggers' Screws, Caulkers' Tools, Pump Chambers, Belaying Pins, Marlin Spikes, Malleable Iron Castings, and General Hardware.

GALVANIZING DONE TO ORDER.

WILSON MFG. COMPANY,
Warehouse 97 Chambers and 81 Reade Streets, N. Y.

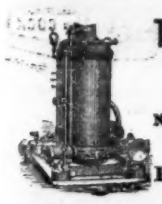
The Frazer Axle Grease and Lubricator.

A pure Lubricator, free from water, gum or sediment. The best article made for *Wagons, Open Journals, Cog wheels Rollers* and wherever a *Solid Lubricator* or *Grease* can be applied. Put up in Boxes, Kegs and Barrels. For prices see New York Price List in this paper.
Established 10 years.

Frazer Lubricator Company,
104 Malden Lane, New York.

IMPROVED
Engine Lathes

SCREW MACHINES, &c.
JONES, LAMSON & CO.,
Windsor, Vt.



The Whitmore Engine.

SAFEST, CHEAPEST & BEST.

Lovegrove & Co.,
No. 121 South Fourth Street,
PHILADELPHIA, PA.
Sole Manufacturers
Engines, Boilers and Steam Pumps.

The Hartford Foundry & Machine Co

Successors to the
Woodruff & Beach Iron Works,
HARTFORD, CONN.
J. S. Hunter, Prest. E. J. Murphy, Treas. & Sec.
High and Low Pressure Marine & Stationary

STEAM ENGINES AND BOILERS,

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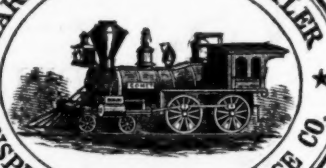

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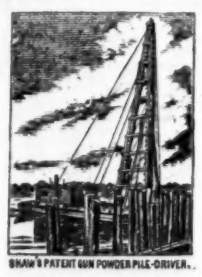

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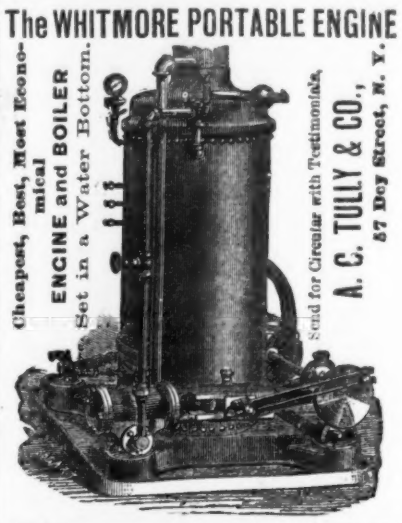

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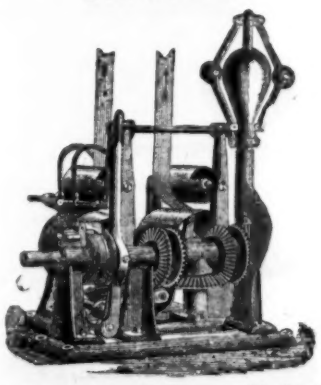

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